

# POIRIERIA



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**Nancy Smith, 43 West Tamaki Road, Glen Innes, Auckland, New Zealand.**

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**The Secretary, R. A. Tyson, 16 Kain St, Mt Eden, Auckland 4, New Zealand**

## LITTLE BARRIER TRIP

Reminiscences by Betty Headford

15<sup>th</sup> - 17<sup>th</sup> Oct 2002.

*Trip Participants: Gladys Goulstone, Bruce Hazelwood, Neville Hudson, Margaret Morley, Doug Snook, Glenys Stace, Fiona Thompson, Rosa & Richard Tyson, and Betty Headford.*

This was a trip that had been on my wish list for years and suddenly Rosa made it all happen. It more than lived up to my expectations.

We were blessed with a beautiful day and such calm silken seas. Tiritiri Matangi Island cast its spell on us all with its magical birdsong and rare birds such as saddlebacks and kakariki flitting within a few feet of us.

We rendezvoused and stopped off Motuora Island to unload drums of fuel and supplies into the Doc ranger's runabout before sailing on past Kawau Island. A small pod of dolphins played under our bow and then we sailed through the middle of a school of fish with gannets and sooty shearwaters diving and feeding. There were also quite a number of little blue penguins.

As we approached Little Barrier Island, its sheer cliffs, steep bush clad ridges and rugged high peaks clear of any cloud left a deep impression of remote grandeur.

I have a host of favourite "snapshots" in my mind. Will Scarlett gunning the runabout onto the trolley that then winched the boat up to the boatshed. No wet feet. The smooth round boulders of many warm colours that mosaiced the shoreline. The twisted wind sculptured grove of pohutukawas that leaned towards the Point. The four grand matriarchs at the end of Titoki Point standing tall against the skyline. They must be one of the most well known tree portraits of NZ.

The beautiful almost voluptuous nikau, so rounded and laden with large mauve to wine coloured flower drupes. A cheeky kaka with an almost visible grin "hanging about" from the spouting in eager anticipation of either a quick handout or better still access to all the treats he could see inside. We had to keep that door locked as the clever little burglar had learned how to open it

I hesitate to say this, but, if you went solely for shell hunting and things marine you'd have been sadly disappointed. If, on the other hand, you were excited by the three "B's -botany, birds and bugs - you were in heaven.

On the second day, despite the dampening forecast, five of us decided we were feeling energetic enough to try the Hamilton Track. Luckily we tackled it the right way around – up a long sloping ridge continuously climbing, but not too steeply.

We soon noticed a change in vegetation from the pohutukawa, puriri, taraire nikau, and kanuka forest hung with astelias and an understorey of macropiper and matipo to young kauri and black or hard beech, cyathias and small tanekaha (didn't see an adult tree) The understorey was thicker with lots of flowering hebes, their flowers ranging from white through to purple. We saw 4 different orchids; the green hooded orchid, 2 types of earina and another ground orchid only a week or two away from opening its blooms. There were lots of lichens, lycopodiums, ferns and fungi.

We collected lots of litter samples for Bruce Hazelwood but the ground was amazingly very dry. We were not very confident that our samples would harbour any wonderful finds. Gladys found what looked like a "leaf slug" under a fallen nikau frond. It was about 4 cm long, dark coloured with a pale blue/grey stripe. There were very few insects, a millipede, cockroaches, small moths and no snails. But Neville made a wonderful discovery at the crest of the track where we had to turn onto the Valley track to come back down. In the rotting crumbly wood of an old tree stump was a peripatus. It was about two inches long and a dark velvety blue. Gorgeous! It was carefully returned to its home.

The track down was, at times, precipitous. It was quite challenging and we were glad it hadn't rained as yet to make it even more hazardous. We had heard and seen lots of tuis, bellbirds, wood

pigeons, saddlebacks, and, amazingly, stitchbirds. Then when we were down on the valley floor, crossing the dry pebbly creek numerous times, the drizzle started.



The warm dry roomy bunkhouse was certainly a most welcoming sight.

Both nights we went out hunting. We hoped to find wetas and kiwis. Doug and I were lucky. We saw a kiwi dashing and dodging our torchlights its feathers a glistening pattern merging with the night shadows. We followed it for a while trying to keep it in our lights so others could see him but to no avail.

The wetas were another story. Like the kiwis we could hear them but not find them. Neville

persisted after all sane people had given up and gone to bed. But for his pains he was rewarded and even got a photo to prove it.

On the last morning Will Scarlett, the ranger, took us to look at the tuatara and told us all about the breeding programme they have developed to release numbers of tuatara back onto the island when the kiore (pacific rat) have been eradicated. He showed us a number of juveniles (9 year olds) 30 to 35 cms long. They were reasonably lively for this time of year. They had little lime green spikes down their backridge and limey green under their "toes". A gold ring circled their eyes. They had us all fascinated.



Unfortunately our boat was waiting for us. As we left, Little Barrier (Hauturu) showed us her mysterious mood, clouds and swirling mists throwing veils over layers of rainforest covered ridges, her peak under cloud - the meeting place of the winds. I hope I can return again one day.

# SOUTH ISLAND HOLIDAY, APRIL 2002

## Margaret S. Morley

Every few years my husband Con gets a hankering for another visit to the South Island. We were overdue so planned a three week trip in April.

My main aim was to do a submarine trip in Milford Sound to view black coral, sponges, crinoids, brachiopods and other wonders attached to the steep sides of the Sound. On a previous trip I had tried snorkelling but it was very frustrating. As you dive down mixing the top fresh water layer with the fully marine layer below, the visibility becomes a swirling blur.

On the drive south from Auckland to Wellington we stopped at Waikawa (Fig. 1) on the west coast. I walked down the estuary, finding an interesting wash up mainly of bivalves and one live helmet shell *Semicassis pyrum*. The large fleshy cream foot was covered in mucus. The siphon was peach with a paler tip extended well past the anterior notch. The tentacles were also peachy with contrasting black edges and black eye spots at the bases. Long strands of the seaweed *Macrocystis pyrifera* lay tangled on the tide line.



Fig. 1 Map of North and South Islands \* = locations visited

While waiting for the Interisland ferry at Wellington I wandered round the terminal noting the zone of living *Macrocystis* on the breakwater just below low tide. In contrast to Auckland's wharf piles, where the Pacific oyster *Crassostrea gigas* is the dominant species, here the southern mussels *Mytilus edulis* and *Aulacomya atra maoriana* were abundant. Green fronds of *Ulva lactuca* showed through the clear water. Thick swathes of the bright green alga *Enteromorpha intestinalis* flourished near the sewage outflow.

After the scenic drive to Kaikoura I caught most of the low tide at South Bay where there are large specimens of the limpet *Cellana denticulata*. It was intriguing to see the lacy tracks where they had been grazing algae on the rocks. Although the tide did not allow the beach walk to the seal colony there was one posing on the rocks close to the shore. In the evening I drove up the hill to see Beverley Elliot but alas my memory of her house was totally inadequate among all the development, reluctantly I had to give up.

The long drive the next day took us through the Lewis Pass. In Hokitika we paused to visit the ruby rock shop and watch some glass blowing.

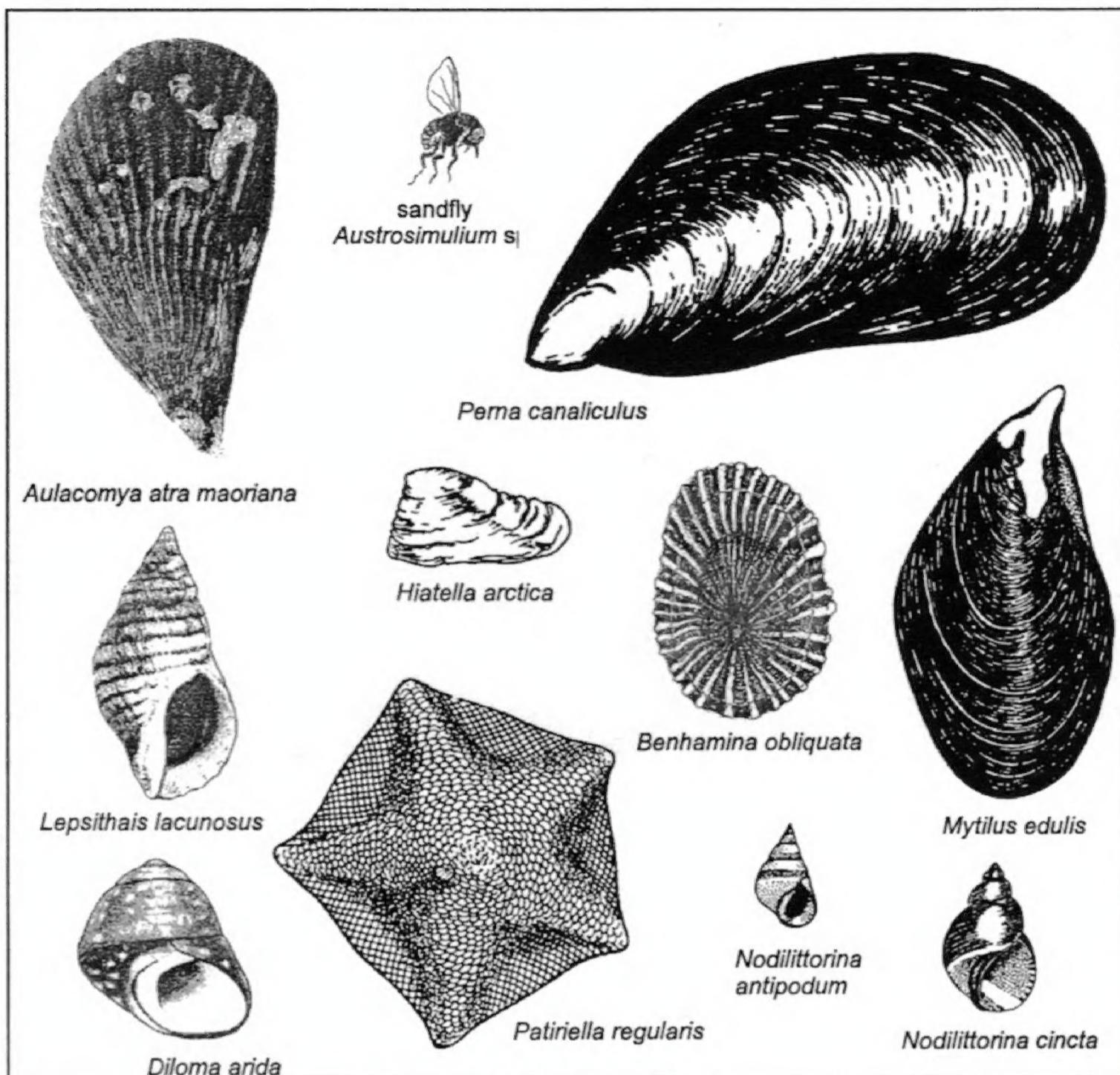
The private bach on the beach at Okarito provided all home comforts even to umbrellas and gumboots! It was blissfully quiet apart from the grumbling of stones tumbled by waves. As I left the bach, low lying early morning mist framed reflections in the still water in the estuary. Around the rocky headland low tide revealed three species of mussels, *Perna canaliculus*, *Aulacomya atra maoriana* and *Mytilus edulis*. Attached near the top on the land side of 4 m high boulders were large siphon limpets *Benhamina obliquata*. The little black mussel *Xenostrobus pulex* packed sparsely into crevices. Other species included *Nodilittorina cincta*, *Notoacmea parviconoidea*, *Diloma arida* and *Cellana radians* (See species list). The bull kelp *Durvillaea antarctica* grew on the most exposed points. It branched into wide fronds close to the stipe unlike that on Auckland's west coast. The white herons or Kotuku only gather at Okarito in the nesting season, but we did see individuals at several places on the west coast, one lives at Milford Sound during the winter.

The store across the road promised easily collected food items until we found it had been closed in 1955! We explored the three mile lagoon track and Con climbed to the trig. station, where he had wide views of Okarito Lagoon. Tomtits, robins and warblers checked out the invaders. The lagoon near the road had a few stressed mud snails *Amphibola crenata* and pipi *Paphies australis*. The original wharf shed had been restored to house historical information.

A clear morning revealed snowy mountains against a brilliant blue sky, an ideal day to take a exhilarating flight over Franz Josef and Fox glaciers. We were the only passengers in a small helicopter, crammed into the cockpit with the pilot alongside. He crossed bush and then followed the glacier up to the neve where we landed for a few minutes to cavort in the snow. The glacial movements of ice were illustrated by pressure ridges and deep crevasses.

Later that day we drove up the glacier road. I walked up the river valley to the terminal face passed schist walls and massive ridges of moraine. The river was swift and turbulent, made chalky grey with suspended rock. Several high waterfalls cascade from vertical side cliffs. Back in 1750 the glacier filled the whole valley, each previous terminal face is signposted showing how the glacier has retreated.

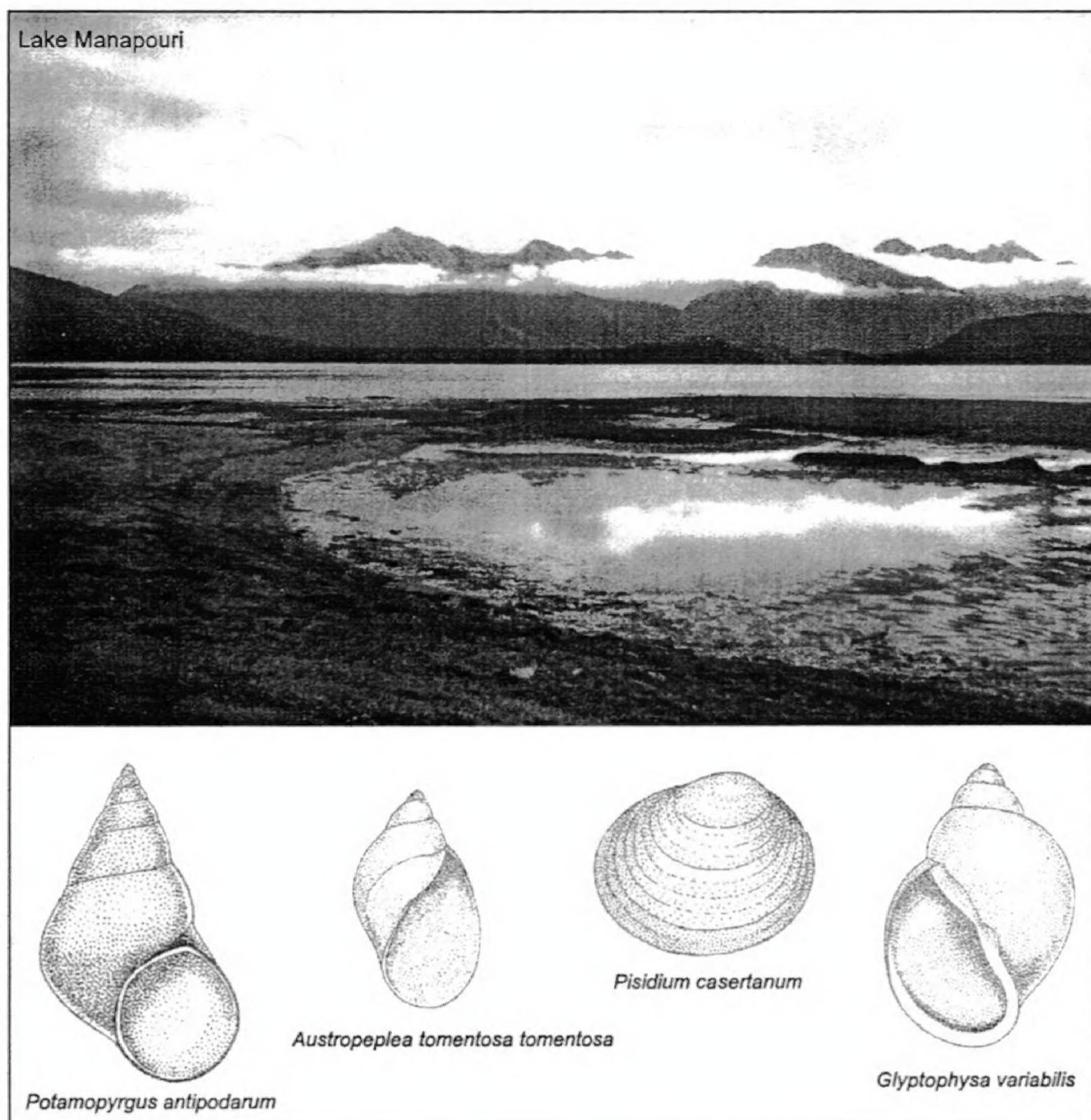
We moved on to Haast ready to tackle another low tide at the crack of dawn. Jackson Bay (Fig. 2) is 20 minutes south of Haast by car, the only sheltered bay on that piece of coast. The local fishing boats anchor here, from the wharf hundreds of large cushion stars *Patiriella regularis* could be seen down to depths of 5 m. The wharf piles were heavily populated with large *Perna canaliculus*.



**Fig. 2 Jackson Bay Species.** Drawings by Powell (1979) and Margaret Morley.

The calm sea allowed good use of the tide. There were lots of rocks to turn as well as vicious hordes of sandflies! Under the rocks were the small bivalve *Hiatella arctica* and the southern rock shell *Lepisithais lacunosus*. Common species were *Diloma arida*, *Nodilittorina antipodum* and occasional *N. cincta*. Apart from Neptunes necklace *Hormosira banksii* and *Corallina officinalis* there were few species of algae, possibly due to a lot of fresh water runoff. A bright green alga *Enteromorpha* grew in pools at high tide. There were the three species of mussels and a calcareous tubeworm. *Patelloida corticata* and large *Turbo smaragdus* were common on low tidal rocks. The chitons *Sypharochiton pelliserpentis* and *Chiton glaucus* were both common. A short track led across the peninsula through bush to an open beach. The paua *Haliotis australis* was washed in dead together with live *Diloma nigerima*.

On the way back to Haast we stopped at Hapuka Reserve. There is an excellent informative track and board walk through bush and wetlands. Next day we drove to Manapouri enjoying magnificent sunny views over Lake Wanaka and Hawea. Red tussock grasses in the higher parts of the alpine pass shimmered in response to the wind. In Cromwell the trees glowed in their autumn colours of yellow and gold. One avenue of poplars was especially glorious. After arrival we went for a walk to admire the red sunset. Many freshly dead mussels *Hyridella menziesi* littered the shore, probably because the level of Lake Manapouri was low.

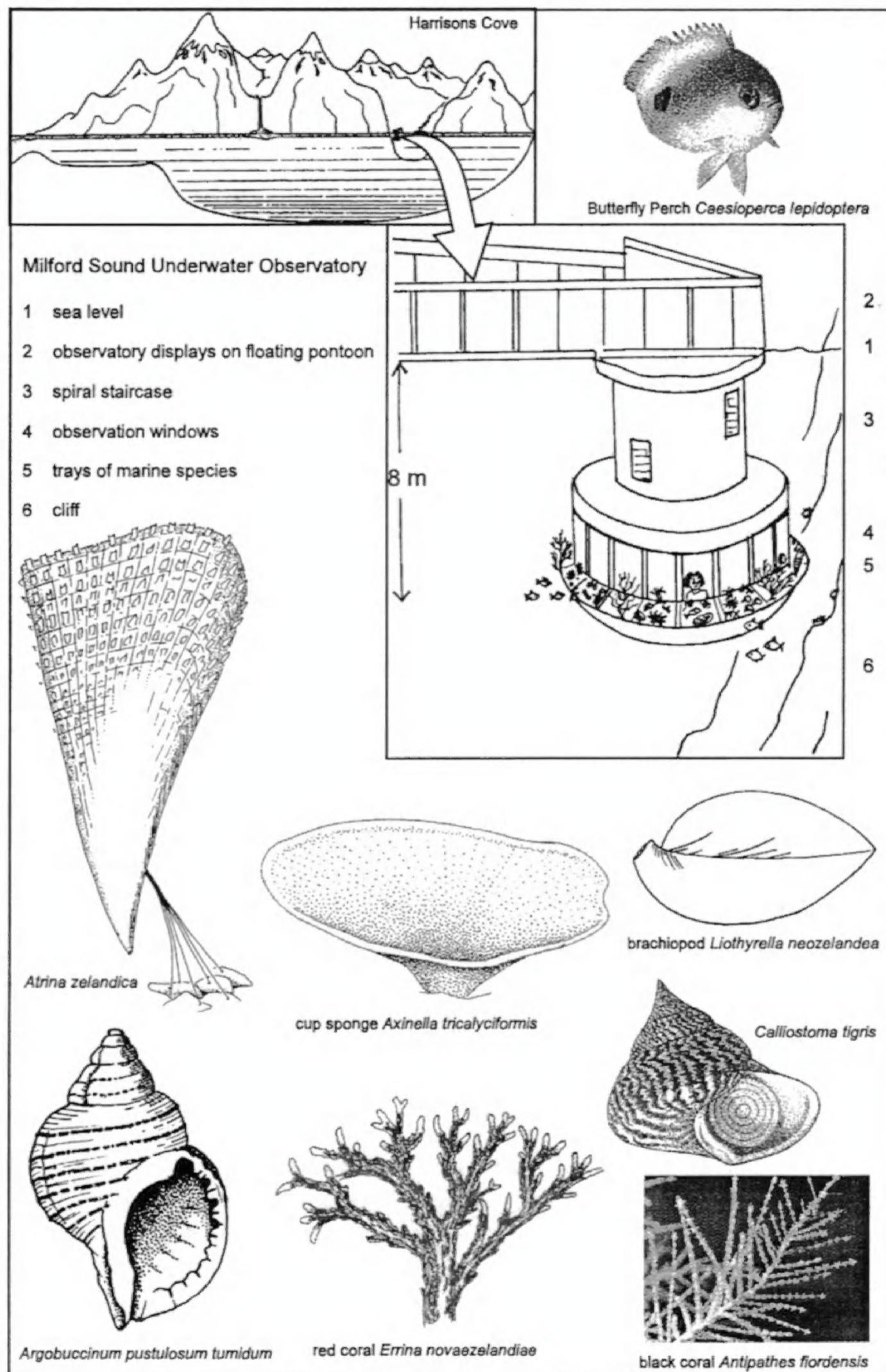


**Fig. 3 Molluscs from Shallow Water Bay, Lake Manapouri**  
Drawings by Powell (1979).

The lower end of the Kepler track starting at Rainbow Reach is a relatively flat day walk through beech forest. The sun didn't penetrate the canopy making it cool. Fallen trunks get covered in moss and king ferns. The colours of many different fungi brightened the track with white, buff, yellow and purple. The long boardwalk over the wetland brings you close to water fowl on the lake. In the wetland vivid red leaved sundews contrasted against the surrounding green moss. Below Moturau hut peaceful views of islands and mountains ranges were reflected in the lake. The detour to Shallow Water Bay was worth while. Fresh water molluscs living in the stream were the sinistral snail *Glyptophysa variabilis*, snails *Austropelea tormentosa tormentosa* and *Potamopyrgus antipodarum*. After much sieving, the bivalve *Pisidium casertanum* was found (Fig. 3). Back at the motel, because I had forgotten to take alcohol, I put the specimens safely in the deep freeze.

Milford Road has several worthwhile stops. We called at the Chasm, Mirror Lakes, Lake Gunn reserve where there are 500 year old trees, walked to waterfalls near the Hollyford track, sampled the Routeburn track climbing to Key Summit and visited a noisy gang of kea at the Homer tunnel.

Unfortunately the submarine company closed down just before our trip. We substituted a scenic boat cruise through Milford Sound to Anita Bay on the open coast. At this point plenty of fish are attracted close to the viewing windows in the hull since the skipper feeds them. A strong black zone at high tide within the Sound results from tightly packed *Xenostrobus securis* (Ryan & Paulin 1998). On the return trip the boat calls at the Underwater Observatory in Harrison Cove (Fig. 4). The cove is a flooded hanging valley which opens onto the main fiord.



**Fig. 4 Milford Sound Observatory and species**  
Drawings by Powell (1987) and Margaret Morley.

The construction began in January and opened in December 1995. The facility is comprised of four separate floating pontoons. The 450 tonne viewing chamber was towed from Bluff to Milford Sound taking 80 hours. Its spiral staircase gives underwater viewing at a depth of 8 m. Outside the thick windows, trays of sea life are attached. A complex colourful feast meets the eye of red and black corals, snake stars, brachiopods, cup and finger sponges, bright yellow zooanthids, crinoids, tube worms with scarlet tentacles, brittle stars, both green and white ascidians, tube anemones, sea cucumbers, nudibranchs, butterfly perch, marble fish, scarlet wrasse and numerous triplefins. Black corals were named from dead specimens, but when living are white. Snake stars live in the branches keeping the coral clean. The large horse mussels *Atrina zelandica* were covered in bryozoans, sponges and tube worms. Shoals of fish, the white echinoid *Pseudechinus huttoni*, the gastropods *Maoricolpus roseus* and *Argobuccinum pustulosum tumidum* could be seen on the cliff face beyond the trays.

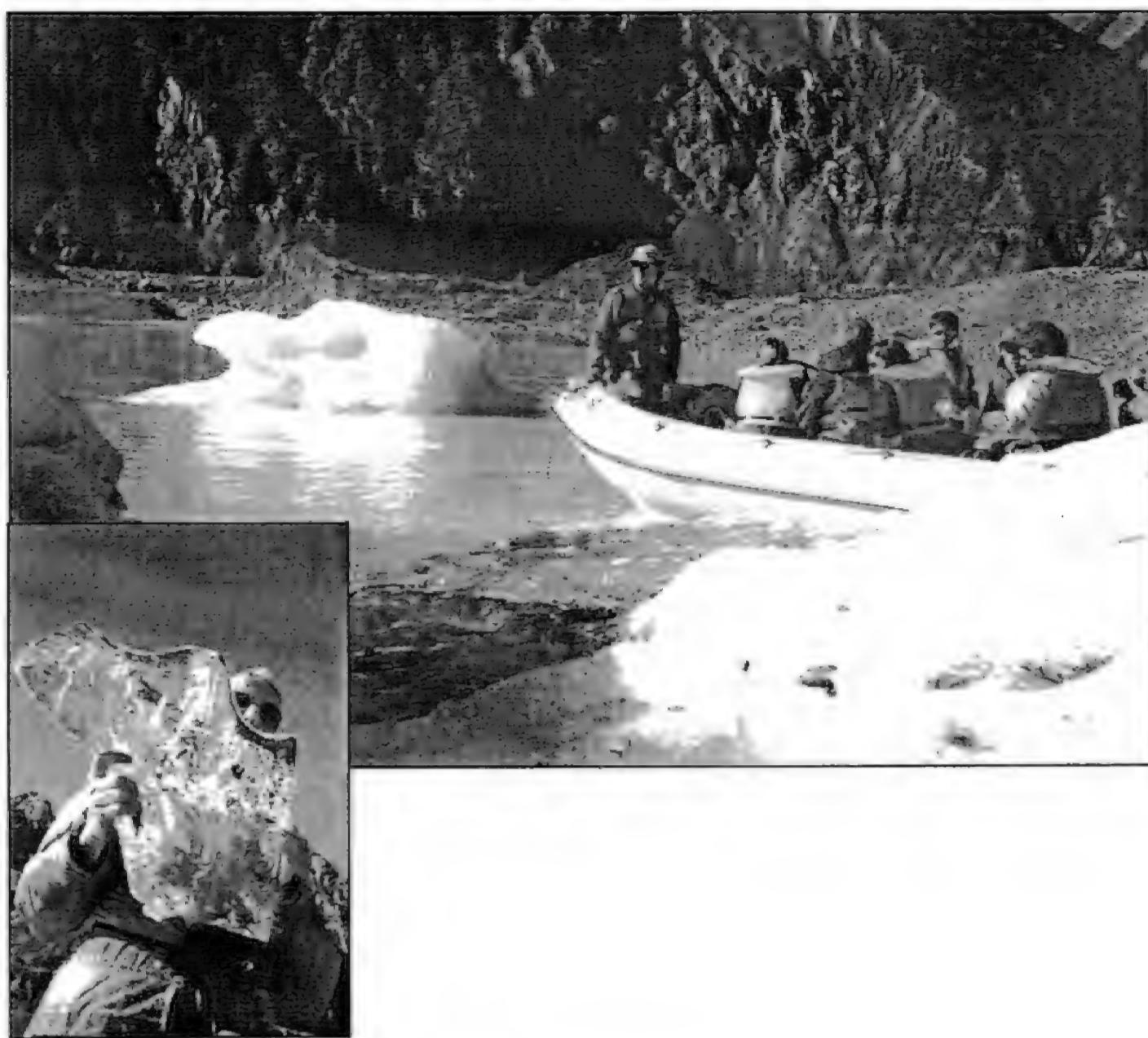
If the salinity at 8 m falls after heavy rain the trays can be temporarily lowered another 6 m on pulleys. Most tourists visit for 30 minutes but I missed that boat and spent another wonderful hour mostly of uninterrupted viewing. The chief diver made me a generous gift of a white brachiopod *Liothyrella neozelandea* (Fig. 4) taken at a depth of 20 m (as a hint to leave?).

Because there are few algae in the fiords marine grazers such as kina, teredo and snails rely on trees from land slips which slide down the steep mountainsides into the water. They consume one beech tree 10 m by 1 m diameter in less than a year (Grange and Goldberg 1992). The book, Fiordland Underwater (Ryan & Paulin 1998) has excellent photographs and detailed text of marine life.

Three hours into the drive to Kingston I remembered the specimens still at Te Anau "safely" in the deep freeze! I was not pleased!! When phoned the motel owner promised to post them home. The option to use the specimens for DNA research by Bruce Marshall was lost but at least I could identify the specimens.

We enjoyed a short ride on the Kingston Flyer to Fairlight and back. Originally the train connected to a ferry to Queenstown. The road through Lindis Pass winds through barren mountains, apart from tussock. A lunch spot at the artificial Lake Dunstan begged to be photographed, not a breathe of wind disturbed the surface resulting in perfect autumn reflections along the valley. In the lake shallows, the introduced gastropod *Lymnaea stagnalis* was common. Views along the Mt Cook road included a glorious rainbow. Next morning we walked the Hooker Valley track in unusually calm conditions. During a steady climb the track goes over two swing bridges reaching a hut. By the time we had continued to the lake formed by the terminal moraine, the mist and cloud had cleared to unveil massive icebergs against a snowy backdrop of Mt Cook.

The following day a trip by boat on the Tasman glacial lake got us even closer, like sucking a 500 year old ice lolly (Fig. 5)! I grabbed a unique chance to clamber out onto an iceberg. The guide was very knowledgeable, she took us more than a kilometre up the lake to see and hear blocks of ice falling off the terminal face at rather close quarters! Here the ice is 200 m thick. Deep crevices glowed blue in the sunlight. Again Mt Cook was clear against a vivid blue sky.



**Fig. 5 Tasman terminal lake, Mount Cook**

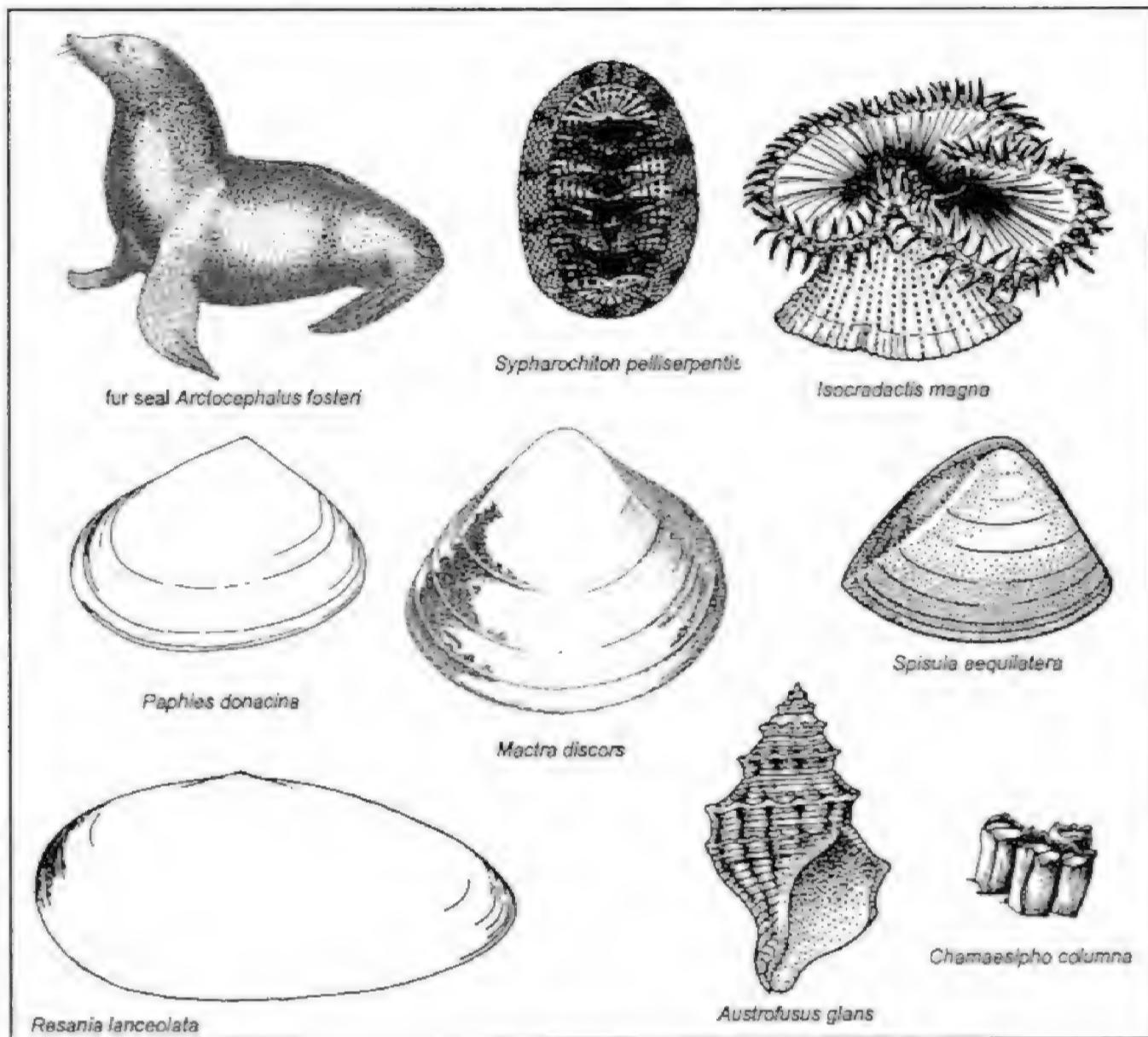
Tourist boat and 500 year old icelolly.

Our luck held seeing Lake Pukaki at its best. Following an overnight stop at Springfield, we travelled through Porters and Arthur passes. There were some lovely effects of low lying clouds in the valleys. At the Visitors Centre the full sized horse carriage where passengers sat up on top was impressive. In those days the journey took 36 hours. The mighty engineering of the Otira viaduct was another wonder.

In Punakaiki the self contained flat set in bush was adjacent to a walkway to the beach. Ignoring notices about not walking on the rock platform, I gained the shingle beach. Limestone boulders contained many fossils including bivalves, brachiopods, crabs and echinoderms. There was a low diversity of recent species reflecting the exposed conditions. The obvious ones were *Nodilittorina cincta*, *N. antipodum*, *Cellana radians*, *Patelloidea corticata*, *Lepsiella albomarginata*, *Perna canaliculus*, *Mytilus edulis*, *Sypharochiton pelliserpentis* and a stalked barnacle. Bull kelp *Durvillaea* growing on the rocky point was one of the few seaweeds. Grey shags patrolled for fish.

The nikau along the nearby Porari River track are the southernmost palms in the world. The track follows a spectacular deep limestone gorge. *Potamopyrgus antipodarum* were common in the river. Opposite the track entrance the beach had a small wash up of bivalves *Spisula aequilatera*, *Mactra murchesoni* and double *Resania lanceolata*. The wind was so strong it was blowing the tops off the waves.

Using Westport as a base we walked the Cape Foulwind Track starting at opposite ends. Fortunately it did not live up to its name given by Captain Cook, remaining calm and sunny. I began at Tauranga Bay finding a good wash up of paired bivalves *Spisula aequilatera*, *Mactra discors*, *Paphies donacina*, gastropods *Austrofusus glans* and *Semicassis pyrum*. Live on rocks were *Sypharochiton pelliserpentis*, *Notoacmea parviconoidea*, *Nodilittorina cincta*, *N. antipodium*, *Lepsiella albomarginata*, *Xenostrobus pulex*, the barnacle *Chamaesipho columnna* and anemone *Isocradactis magna* (Fig. 6).



**Fig. 6 Species at Tauranga Bay, Cape Foulwind, Westport**  
Drawings by Powell (1987) and Margaret Morley.

The walkway passes along the cliffs at one point above a seal colony. Over forty seals were ashore, some pups suckling, others playing games in a rock pool and one calling loudly for mother. Farms adjoin the track with a granite quarry in operation further inland. At the other end of the walkway an automatic lighthouse has replaced the old wooden one. I found our car to return to Tauranga Bay where we treated ourselves from an enterprising icecream van, the local vandals or weka demanding a share. I even remembered to retrieve my stash of shells.

In the afternoon to take advantage of clear skies, we drove 10 km up a steep grade to Denniston, an old coalmine. At the top there are wide views south to Cape Foulwind and north along the coast. You can wander among mining relics such as hoppers, wheels, rail incline and 5 m tall, expertly crafted, drystone walls.

The Charming Creek Walkway uses the railway tracks put in for coal and timber extraction. It goes through bush, tunnels and over a suspension bridge beside the river. Due to the heavy rain, waterfalls were in full spate. We were grateful for a sheltered lunch at the site of the old timber mill. The owners devised a high aerial cable of wire ropes and pulleys between trees

to transport the logs to the mill. A visit to the Coaltown Museum was worthwhile (and dry!), especially the full sized coal wagon coming down the unbelievably steep incline. I was dismayed to see the New Zealand penguin display included Pacific cones, cowries and a large *Cerithium*!

We spent a day at Oparara near Karamea. The 14 km long access road is metalled, very narrow with sharp bends, also generously endowed with pot holes and ridges! However the effort was well rewarded by views on the Oparara Arch track. A torch is useful during the clamber under the natural limestone bridge which spans the river, at the far end the bush is framed by the exit. The water is coloured deep tan by humic acid from the bush. Other sites at Oparara included a second arch, Mirror Lakes, a Paving stone cave and a Box Cavern. The paving stone effect on the floor of the cave was formed when a silty flood dried out. Large weta eating spiders suspend their white egg sacs from the roof of the cave. The Box Cavern was high and deep enough to enclose you in darkness around a bend.

We decided to leave the rain behind and drive to the Nelson Lakes but the rain was so fond of us it came too! Walks around the lakes were rather damp and gloomy except for cheerful calls of many bell birds and colourful varieties of fungi. The Restoration Project to reduce predator numbers is proving successful. On one of a variety of tracks you can walk through a gully marking the Alpine Fault.

The early drive to Picton was not needed as the ferry was cancelled! Ironically it was calm in Picton but big seas were still running in Cook Strait. I used the unexpected time to visit the new aquarium on the waterfront. This has large tanks, an underwater viewing window and a wide selection of marine and fresh water species including Galaxiids. I appreciated the touch tank they have for children! A hurried opening meant they still had to replace temporary labels and stock empty tanks.

The following day after walking tracks, hanging about and many phone calls we finally sailed for Wellington. The grand memories of the South Island have been relived in photographs of glacial lakes and west coast mountains. Thankfully there remain more South Island unvisited delights as impetus for a future trip.

### **South Island Species List April 2002**

JackB = Jackson Bay

TaurB = Tauranga Bay

Por = Porari

Okar = Okarito

Pun = Punakaiki

Kaik = Kaikoura

LMan = Lake Manapouri

LDun = Lake Dunstan

MilfS = Milford Sound

ChCk = Charming Creek

Haast = Haast

West = Westport

l=live, ll=common, d=dead

dd=common, AW=algal wash

|   | JackB | TaurB | Por | Okar | Pun | Kaik | LMan | LDun | MilfS | ChCk | Haast | West |
|---|-------|-------|-----|------|-----|------|------|------|-------|------|-------|------|
| <b>Chitons</b>                            |       |       |     |      |     |      |      |      |       |      |       |      |
| <i>Chiton glaucus</i>                     | II    |       |     |      |     |      |      |      |       |      |       |      |
| <i>Sypharochiton pelliserpentis</i>       | I     | I     |     | I    | I   | I    |      |      |       |      |       |      |
| <b>Gastropods</b>                         |       |       |     |      |     |      |      |      |       |      |       |      |
| <i>Amphibola crenata</i>                  |       |       |     | I    |     |      |      |      |       |      |       |      |
| <i>Argobuccinum pustulosum tumidum</i>    |       |       | d   |      |     |      |      |      |       | I    |       |      |
| <i>Austrofusus glans</i>                  |       |       |     |      |     |      |      |      |       | d    |       |      |
| <i>Austropeplea tormentosa tormentosa</i> |       |       |     |      |     |      |      | II   |       |      |       |      |
| <i>Benhamina obliquata</i>                | I     |       |     |      | I   |      | I    |      |       |      |       |      |
| <i>Buccinulum vittatum</i>                |       |       |     |      |     |      | I    |      |       |      |       |      |
| <i>Cantharidella tesselata</i>            | II    |       |     |      | I   |      | I    |      |       |      |       |      |
| <i>Cellana denticulata</i>                |       |       |     |      |     |      | II   |      |       |      |       |      |
| <i>Cellana ornata</i>                     | I     |       |     |      |     | I    |      |      |       |      |       |      |
| <i>Cellana radians</i>                    | I     |       |     |      | I   | I    |      |      |       |      | I     |      |
| <i>Cellana stellifera</i>                 | I     |       |     |      |     |      |      |      |       |      |       |      |
| <i>Cookia sulcata</i>                     |       |       |     |      | d   |      | I    |      |       |      |       |      |
| <i>Diloma arida</i>                       | II    |       |     |      | I   |      |      |      |       |      |       |      |
| <i>Diloma bicanaliculata</i>              | I     |       |     |      |     |      |      |      |       |      |       |      |
| <i>Diloma nigerrima</i>                   | I     |       |     |      |     |      |      |      |       |      |       |      |
| <i>Eatoniella olivacea</i>                |       | IAW   |     |      |     |      |      |      |       |      |       |      |
| <i>Eatonina atomaria</i>                  |       | IAW   |     |      |     |      |      |      |       |      |       |      |
| <i>Eatonina subflavescens</i>             |       | IAW   |     |      |     |      |      |      |       |      |       |      |
| <i>Evalea subulosa</i>                    | d     |       |     |      |     |      |      |      |       |      |       |      |
| <i>Glyptophysa variabilis</i>             |       |       |     |      |     |      | I    |      |       |      |       |      |
| <i>Haliotis australis</i>                 | d     |       |     |      |     |      |      |      |       |      |       |      |
| <i>Lepsiella albomarginata</i>            | I     | I     |     | I    | I   | I    |      |      |       |      |       |      |
| <i>Lepithais lacunosus</i>                | I     |       |     |      |     |      |      | II   |       |      |       |      |
| <i>Lymnaea stagnalis</i>                  |       |       |     |      |     |      |      |      |       |      | I     |      |
| <i>Maoricolpus roseus</i>                 |       |       |     |      |     |      |      |      |       |      |       |      |
| <i>Melagraphia aethiops</i>               | I     | I     |     |      |     |      | I    |      |       |      |       |      |
| <i>Modelia granosa</i>                    | d     |       |     |      |     |      | d    |      |       |      |       |      |
| <i>Neoguraleus murdochii</i>              | I     |       |     |      |     |      |      |      |       |      |       |      |
| <i>Nodilittorina antipodum</i>            | I     | I     |     | I    | I   | I    |      |      |       |      |       |      |
| <i>Nodilittorina cincta</i>               | I     | I     |     | I    | I   | I    |      |      |       |      |       |      |
| <i>Notoacmea elongata</i>                 | I     |       |     |      |     |      |      |      |       |      |       |      |
| <i>Notoacmea helmsi</i>                   | I     |       |     |      |     |      |      |      |       |      |       |      |
| <i>Notoacmea parviconoidea</i>            | I     | I     |     |      |     |      |      |      |       |      |       |      |
| <i>Notoacmea subtilis</i>                 | d     |       |     |      |     |      |      |      |       |      |       |      |
| <i>Paratrophon patens</i>                 | d     |       |     |      |     |      |      |      |       |      |       |      |
| <i>Patelloida corticata</i>               | I     |       |     |      |     |      | I    |      |       |      |       |      |
| <i>Pisinna zosterophila</i>               |       | IAW   |     |      | IAW |      |      |      |       |      |       |      |
| <i>Potamoprygus antipodarum</i>           |       |       | II  |      |     |      |      |      |       | II   |       |      |
| <i>Risellopsis varia</i>                  | I     |       |     |      |     |      |      |      |       |      |       |      |
| <i>Semicassis pyrum</i>                   |       | d     |     |      |     |      |      |      |       |      |       |      |
| <i>Sigapatella novaezelandiae</i>         | I     |       |     |      |     |      |      |      |       |      |       |      |
| <i>Siphonaria australis</i>               | I     |       |     |      |     |      |      |      |       |      |       |      |
| <i>Siphonaria propria</i>                 | I     |       |     |      |     | I    |      |      |       |      |       |      |
| <i>Turbo smaragdus</i>                    | II    | I     |     | I    | I   |      | II   |      |       |      |       | I    |
| <i>Xymene traversi</i>                    | I     |       |     |      |     |      |      |      |       |      |       |      |
| <i>Zeacolpus delli?</i>                   | d     |       |     |      |     |      |      |      |       |      |       |      |
| <i>Zeacolpus symmetricus?</i>             | d     |       |     |      |     |      |      |      |       |      |       |      |
| <b>Bivalves</b>                           |       |       |     |      |     |      |      |      |       |      |       |      |
| <i>Atrina zelandica</i>                   |       |       |     |      |     |      |      |      |       | I    |       |      |
| <i>Aulacomya atra maoriana</i>            | I     |       |     |      | I   | I    |      |      |       | I    |       |      |
| <i>Borniola reniformis</i>                | d     |       |     |      |     |      |      |      |       |      |       |      |
| <i>Chlamys zelandiae</i>                  | d     |       |     |      |     |      |      |      |       |      |       |      |
| <i>Dosinia anus</i>                       |       | d     |     |      | d   | d    |      |      |       |      |       | d    |
| <i>Hiatella arctica</i>                   | I     |       |     |      |     |      |      |      |       |      |       |      |
| <i>Hyridella menziesi</i>                 |       |       |     |      |     |      |      |      |       | II   |       |      |
| <i>Lasaea hinemoa</i>                     | d     |       |     |      |     |      |      |      |       |      |       |      |
| <i>Mactra discors</i>                     |       | dd    |     |      | d   | d    |      |      |       | d    | d     | d    |
| <i>Mactra murchesoni</i>                  |       |       |     | d    |     |      |      |      |       |      |       |      |
| <i>Mytilus edulis</i>                     | I     | I     |     | I    | I   | I    |      |      |       |      |       |      |
| <i>Neolepton antipodum</i>                | d     |       |     |      |     |      |      |      |       |      |       |      |

|                                  | JackB | TaurB | Por | Okar | Pun | Kaik | LMan | LDun | MifS | ChCk | Haast | West |
|----------------------------------|-------|-------|-----|------|-----|------|------|------|------|------|-------|------|
| <i>Panopea zelandica</i>         |       |       |     |      | d   |      |      |      |      |      |       |      |
| <i>Paphies australis</i>         | 1     |       |     | 1    |     |      |      |      |      |      |       |      |
| <i>Paphies donacina</i>          |       | d     |     | d    | d   |      |      |      |      |      | d     | d    |
| <i>Perna canaliculus</i>         | 1     | 1     |     | 1    | 1   | 1    |      |      |      |      |       | 1    |
| <i>Peronaea gaimardi</i>         |       |       | d   |      |     | d    |      |      |      |      |       |      |
| <i>Pisidium casertanum</i>       |       |       |     |      |     |      | 1    |      |      |      |       |      |
| <i>Protothaca crassicosta</i>    |       | d     |     |      |     |      |      |      |      | d    |       |      |
| <i>Resania lanceolata</i>        |       |       | d   | d    |     |      |      |      |      | d    |       | d    |
| <i>Spisula aequilatera</i>       |       |       | dd  | dd   | d   | d    |      |      |      | d    | d     | d    |
| <i>Xenostrobus pulex</i>         | 1     | ll    |     |      | 1   |      |      |      |      |      |       | 1    |
| <i>Xenostrobus securis</i>       |       |       |     |      |     |      |      |      |      | ll   |       |      |
| <b>Brachiopods</b>               |       |       |     |      |     |      |      |      |      |      |       |      |
| <i>Calloria inconspicua</i>      |       |       |     |      |     |      |      |      | 1    |      |       |      |
| <i>Magasella sanguinea</i>       |       |       |     |      |     |      |      |      | 1    |      |       |      |
| <i>Neothyris lenticularis</i>    |       |       |     |      |     |      |      |      | 1    |      |       |      |
| <i>Notosaria nigricans</i>       |       |       |     |      |     |      |      |      | 1    |      |       |      |
| indet. white juvenile            |       |       |     | d    |     |      |      |      |      |      |       |      |
| <i>Liothyrella neozelandea</i>   |       | d     |     |      |     |      |      |      |      |      |       |      |
| <b>Echinoderms</b>               |       |       |     |      |     |      |      |      |      |      |       |      |
| <i>Fellaster zelandica</i>       |       |       | 1   |      |     |      |      |      |      |      |       |      |
| <i>Patiriella regularis</i>      |       | ll    |     |      |     | 1    |      |      |      |      |       |      |
| <i>Pseudechinus huttoni</i>      |       |       |     |      |     |      |      |      | 1    |      |       |      |
| <i>Stichopus mollis</i>          |       |       |     |      |     |      |      |      | 1    |      |       |      |
| <i>Astrobrachion constrictum</i> |       |       |     |      |     |      |      |      | 1    |      |       |      |
| <b>Crabs</b>                     |       |       |     |      |     |      |      |      |      |      |       |      |
| <i>Halicarcinus innotatus</i>    | 1     |       |     |      |     |      |      |      |      |      |       |      |
| <i>Hemigrapsus edwardsi</i>      | 1     |       |     |      |     |      |      |      |      |      |       |      |
| <i>Petrolisthes elongatus</i>    | ll    |       |     |      |     |      |      |      |      |      |       |      |
| <i>Cancer novaezelandiae</i>     |       |       | 1   |      |     |      |      |      |      |      |       |      |
| <b>Barnacles</b>                 |       |       |     |      |     |      |      |      |      |      |       |      |
| <i>Chamaesipho columna</i>       |       |       | 1   |      |     |      |      |      |      |      |       |      |
| Stalked barnacle                 |       |       |     |      |     | 1    |      |      |      |      |       |      |
| <b>Anemones</b>                  |       |       |     |      |     |      |      |      |      |      |       |      |
| <i>Isocradactis magna</i>        |       |       | 1   |      |     |      |      |      |      |      |       |      |
| <b>Algae</b>                     |       |       |     |      |     |      |      |      |      |      |       |      |
| <i>Durvillaea antarctica</i>     | 1     |       |     |      |     | 1    |      |      |      |      |       | 1    |
| <i>Cladophora verticillata?</i>  | 1     |       |     |      |     |      |      |      |      |      |       |      |
| <i>Enteromorpha sp.</i>          | 1     |       |     |      |     |      |      |      |      |      |       |      |
| <i>Hormosira banksii</i>         | 1     |       |     |      |     |      |      |      | 1    |      |       |      |
| <i>Corallina officinalis</i>     | 1     | 1     |     |      |     |      |      |      |      |      |       |      |
| <i>Haliptilon roseum</i>         |       | 1     |     |      |     |      |      |      |      |      |       |      |
| <i>Macrocystis pyrifera</i>      |       |       |     |      |     | 1    |      |      | 1    |      |       |      |
| <i>Ulva lactuca</i>              | 1     |       |     |      |     | 1    |      |      |      |      |       |      |

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Special thanks to Bruce Hayward for suggesting improvements, formatting the article and for data on *Paratrophon patens* from Jackson Bay and to Jessica Hayward for scanning and compiling the figures.

## The Yellow Cellar Slug

*John Murphy and Bruce Hazelwood*

*Limacus flavus* (Linnaeus, 1758) is a retiring species and lives in colonies where there is some dampness.

Our colony (J.M.), 159 Birkenhead Avenue, Birkenhead Auckland, is of about thirteen animals, (my brother Neil counted them) and frequents the cats bowl at night. Most mornings, all that is left, is a series of silvery slime trails. Unfortunately we sometimes tread on the occasional slowcoach. My friend Bruce Hazelwood tore his hair out when I told him, as I forgot to save a specimen for study. In order to protect them, I have devised a warning system of flashing lights, bells and hooters, now we are afraid to go into the kitchen at night. Also for fear of waking the neighbours. Any suggestions please?

I (B.F.H.) have collected extensively within a six kilometre radius of Ellerslie, Auckland, and have found *L. flavus* to be relatively common, especially within water meter boxes. I have found *L. flavus* on Great Barrier Island, (B.F.H. 2000A.D.)

**The following extracts are gleaned from Naturalised terrestrial Stylommatophora**

**(Mollusca: Gastropoda) Gary M. Barker**

### Type Material

Described from Europe without precise type locality, but presumably from Sweden or England. The type material no longer exists.

### Distribution

Because of the confusion of *Limacus flavus* with members of the genus *Limax* and its strong synanthropy<sup>1</sup>, the original distribution is not known. Bruijns *et.al.* (1959) considered *L. flavus* to be of Mediterranean origin. It occurs widely in western Europe, and has been introduced to many parts of the world, including Japan, China, St. Helena, Madagascar, Canada, the USA, South Africa, Australia, Rarotonga, Vanuatu and New Zealand.

### Recommended common name

Yellow cellar slug

### Material examined - New Zealand

**AK.** Te Atatu, 15 Sept 1974 R.A. & M.A. Cumber; 15 Feb 1978, M. Tocker, in shadehouse associated with potting plants. Glen Innes, 26 Jan 1978, L.M. Dean, in house cellar. Titirangi, 23 Nov 1969, P.S. Dale. **WO.** Hamilton, 27 Aug 1977, in stored firewood; 4 Sept 1977, under timber in garden; 10 Oct 1977, in pasture; 13 Nov 1977, under logs in park; 12 June 1978, in grassy area at roadside; 2 Aug 1978, on footpath at night; 24 Sept 1978, under logs in *Cypressus* shelter belt. Tokoroa, 26 June 1978, under *Pinus* logs; 8 Jan 1979, V.J. Crocker, under timber in garden. Waitomo, 19 Sept 1978, under limestone rocks in pasture. **BP.** Omokoroa, May 1997, P.C. Mayhill. **GB.** Gisborne, 11 Jan 1978, G. Halliwell. **TK.** Hawera, 6 Feb 1995, R. Harrison, abundant at night on moist carpet in shop. **WN.** Levin, 15 Nov 1992, A. Carpenter. Wellington, 29 Aug 1978, M. Peters, in stored firewood. **BR.** Greymouth, 16 Sept, J.S. Paterson. **MC.** Halswell, Nov 1976, R. H. Blank. **DN.** Dunedin, 10 Jan 1978, D. Farrell. **SL.** Gore, 16 Jan 1978, A.J. Mc.Craw.

**Extralimital - Poland.** Ostrów Wielkopolski, 2 May 1954, L. Berger, det. A. Wiktor.

**South Africa.** Stellenbosch, Cape Province, 1978, col. & det. W. F. Sirgel.

### History in New Zealand

*L. flavus* was first recorded in New Zealand from Dunedin by Hutton (1879). A few years later Hutton (1883) added Greymouth as a locality. These records were quoted by Musson (1891), Suter (1891), and others without additional information. Taylor (1902-07/ 1902-21) listed as localities Dunedin and Greymouth, after Hutton, plus Hokitika on the basis of specimens collected by W.D. Roebuck. Suter (1913) considered the species both common and injurious to vegetables, but gave no further locality information. Thomson (1922) also regarded *L. flavus* as common, but gave only Dunedin, Greymouth and Taranaki as localities. These records were repeated in subsequent literature without additional information (e.g. Whitten 1955, Powell 1979). While recognising the wide distribution of *L. flavus* in New Zealand, Barker (1979, 1982) noted that the extent of its dispersal was not fully documented.

### Remarks

<sup>1</sup>Synanthropy and Synanthropic - Close to human habitation

*L. flavus* of Europe has recently been recognised as comprising a species complex (Chatfield 1976, Evans 1978a,b, 1982, 1985, 1986, Likharev & Wiktor 1980, Wiktor & Norris 1982, Wiktor 1983a, Forcart 1986) (see above). All earlier information pertaining to *L. flavus* should therefore be viewed with caution.

*L. flavus* tends to be polymorphic in body colouration, and numerous variety names are to be found in the literature (e.g., Taylor 1902-07 (1902- 21), Hesse 1926, Quick 1960)

An introduction to the literature on *L. flavus* is provided by Germain (1930), Pilsbry (1948 (1939-48), van Regteren Altena (1950), Likharev & Rammelmeier (1952), Quick (1960), Giusti (1973, 1976, Wiktor (1973, 1983a, 1989), Backhuys (1975), Likharev & Wiktor (1980), Castillejo (1982), Alonso *et al.* (1986) and Evans (1986).

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## TWENTY YEARS AGO

by Nancy Smith

"Poirieria" 1983 (Vol. 13. no. 1) opened with a special issue comprising Jim Goulstones report on Waitakere landsnails. Many years of searching, hours of identifying and drawing the specimens went into this work and it is still the best available reference for these tiny molluscs. The beautiful drawings are very detailed and the areas and numbers are produced in clear tables with a map.

(Vol. 13. no 2) John Graham of Oamaru after 20 years as a line fisherman turned to trawling in 1957 and wrote about the way the marine fauna in his trawls awakened an interest in the subject and he started collecting shells. In 1983 his shells reminded him of many interesting days collecting round NZ and off the Eastern coast of Australia and of the interesting people he met over those years.

A big washup at Te Arai the previous year brought to light a specimen of the Ranellid *Linatella Cutacea* (Link 1816) previously known from the fossil record as *Linatella cingulata* Lamarck. This shell is found in N.S.W. and Fiji. The fossil after many name changes is now called *L. caudata* (Gmelin, 1791) in "Cenozoic Mollusca of New Zealand" Beu and Maxwell, 1990 p.355. It is present at several N.Z. fossil sites round the Bay of Plenty. B. & M. remark on the report of a Recent specimen collected. But has anyone else found this shell? Perhaps there were some in the Pakiri sand at Mission Bay. If so, it would be good to have it reported in Poirieria.

Margaret Morley described the "flight or fight" reaction and illustrated a stressor! This subject is topical on radio and TV at present, with Government preparing legislation against stress in the workplace, so there is your personal report.

Nancy Smith pottered along the beach at Mt Maunganui after a blow, and followed up at Waihi where there was a quite good washup. "Of two nice *Caestana spengleri* found, one had little barnacles on the columnella, beautifully enamelled over. "Was that rare? I don't think I have seen anything quite like it again. (That was my first contribution to "Poirieria" )

Ron Cumber was intrigued by the range of patterns on *Tawera spissa* found in great numbers on Tokerau beach and Houhora Heads in 1979. An Editor's note says of a member returning from England, that she was surprised and delighted to find dozens of *Tawera* valves on Takapuna beach. "—she was reminded of the endless, intricate patterns woven in the blouses worn by Maori ladies in their traditional dress".

Ailsa Cornelius listed the trips and finds of the Otago Shell Club for the previous year. One visit was to the Portobello Marine Research Station and Aquarium followed by fossicking on the shore where they found some shell life not necessarily typical of the harbour as it was discarded from the aquarium.

Norman Douglas updated his report on the vanishing Toheroa (Poirieria Vol. 12 no. 1) with the bad news that horse races were to be held on 90 Mile Beach. Did this ever happen?

# INTERTIDAL AND SHALLOW SUBTIDAL BIOTA OF CUVIER ISLAND

Bruce W. Hayward<sup>1</sup> and Margaret S. Morley<sup>2</sup>

<sup>1</sup>Geomarine Research, 49 Swainston Rd. St Johns, Auckland

<sup>2</sup>Auckland War Memorial Museum, Private Bag 92 018, Auckland

## SUMMARY

This survey records 123 species of molluscs (6 chitons, 98 gastropods, 18 bivalves), 17 crustacea (11 crabs, 6 barnacles), 39 algae and small numbers from other phyla from Cuvier Island, including the extension of geographic range for 2 micromolluscs and one alga. Cuvier has some of the most exposed shoreline found anywhere along the east coast of northern New Zealand and as a result the intertidal and shallow subtidal biota exhibits relatively low diversity (except in micromolluscs). Cuvier's biota differs from that on the west coast of Northland, by the dominance of *Nerita atramentosa* and the seaweeds *Carpophyllum angustifolium*, *Ecklonia radiata* and *Xiphophora chondrophylla*; frequent washups of *Charonia lampas*; and rarity or absence of the common west coast mussels *Perna canaliculus*, *Xenostrobus pulex*, starfish *Stichaster australis*, and bull kelp, *Durvillaea antarctica*.

## INTRODUCTION

A party of 12 Conchology Section members visited Cuvier Island on April 5-6 th 2003. We left Whitianga at 8.30 AM on Silver Wing Charters' fast catamaran. Just eighty minutes later we were circumnavigating the island. We disembarked with our barrelled gear via a zodiac and landed in unusually calm conditions at the old lighthouse keepers' steps. A short climb up a steep concrete path led to the former lighthouse keepers' houses and associated buildings. One of the houses is kept in good repair by DoC and used as a base for visiting parties (mostly research, weed control, trap baiting or historic building restoration work). Here we stayed Saturday night. Saturday was fine and everybody got out and about on the island, exploring and undertaking their studies. Glenys Stace, Chris Horne, Neville Hudson, Heather Smith and Margaret Morley went snorkelling in the fish-swarming and sheltered Landing and Picnic Bays. At low tide, Margaret scoured the intertidal rocks and cobble beach of Landing Bay and recorded the sparse biota present. Bruce Hayward walked across to North West Bay and documented the intertidal biota that was exposed at mid tide. He returned to Picnic Bay for the low tide where the richest intertidal life of the three study sites was found. Low tide during our visit was only middle of the range (0.7 m) and not optimal for obtaining a full record of the low tidal biota.

Cuvier Island (Repanga) covers 175 hectares and lies 40 km east of the northern tip of the Coromandel Peninsula (Fig. 1). Its European name was provided by Dumont Dúrville in 1827 after the French naturalist Baron Georges Cuvier. The land was purchased from the Maori owners in the 1880s. 26 ha was acquired by the Marine Dept. for a lighthouse (erected 1888-9) and settlement. The remainder went into private ownership. The bulk of the island was acquired by the crown in 1957 and declared a reserve for the protection of flora and fauna, subsequently renamed a Nature Reserve.

Previous published work on the intertidal biota of Cuvier Island is limited to a checklist and brief account of 37 species of marine algae studied intertidally and subtidally by Ian Johnstone during an Auckland University Field Club trip in 1968 (Johnstone, 1969). Offshore studies include an annotated list of fish recorded during another Auckland University Field Club trip in 1980 (Hounsley et al., 1981) and two accounts of various aspects of the biota of seafloor sediment dredged offshore (Suter, 1908; Hayward and Grace, 1981).

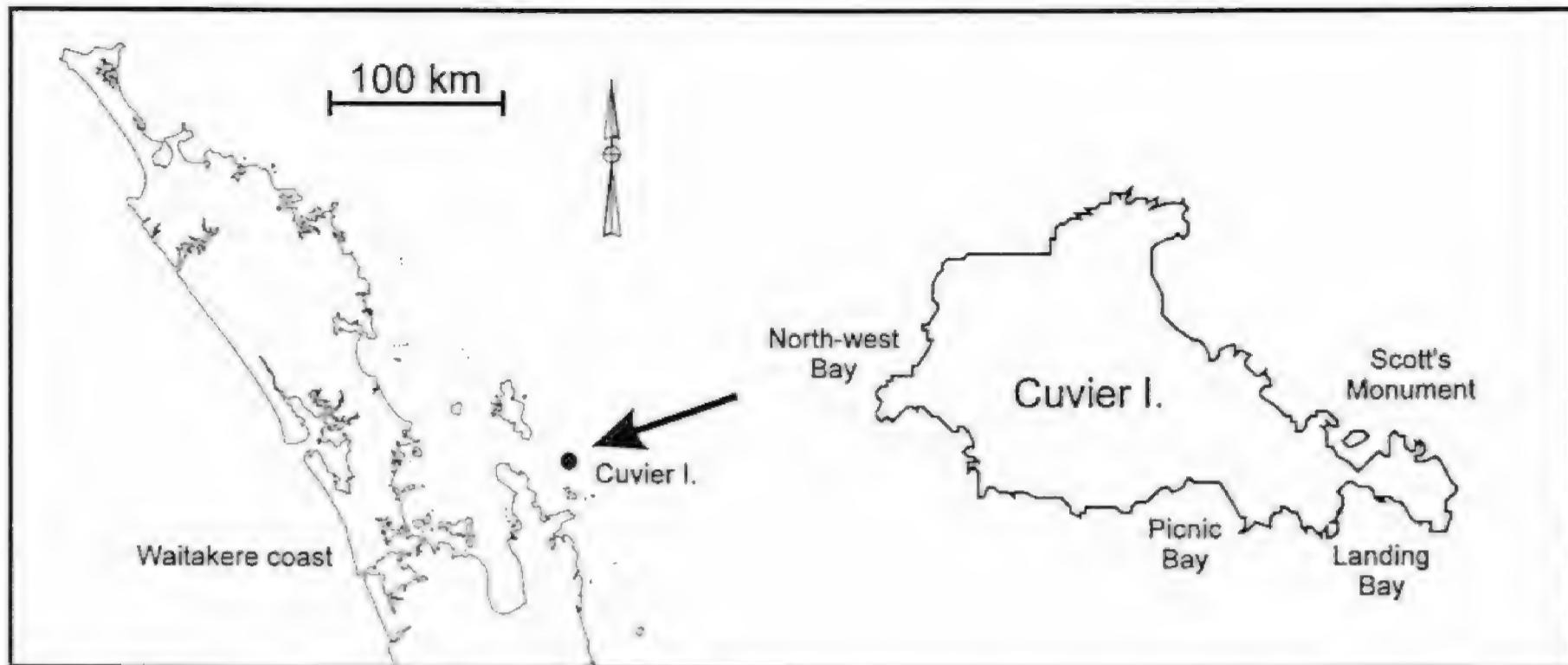


Fig. 1. Location of intertidal study sites on Cuvier Island, north-east of Coromandel Peninsula.

### SPECIES LIST

The species list could be expanded by searching sediment taken by divers from under rocks and at the foot of reef walls in the shallow subtidal.

Voucher specimens of most molluscan and algae taxa are deposited in the marine and botanical collections of the Auckland War Memorial Museum.

#### Qualitative abundance scale:

a = abundant; c = common; f = frequent; o = occasional; r = rare; d = dead; dd = common dead; J = recorded by Johnstone (1969)

|                                     | Landing Bay | Picnic Bay | NW Bay | Scott's Monument |
|-------------------------------------|-------------|------------|--------|------------------|
| <b>MOLLUSCA: CHITONS</b>            |             |            |        |                  |
| <i>Acanthochitona violacea</i>      | d           | d          |        |                  |
| <i>Eudoxochiton nobilis</i>         | r           | o          |        |                  |
| <i>Ischnochiton maorianus</i>       | d           | r          |        |                  |
| <i>Onithochiton neglectus</i>       | d           | r          |        |                  |
| <i>Plaxiphora obtecta</i>           |             | r          |        |                  |
| <i>Sypharochiton pelliserpentis</i> | f           | f          | f      |                  |
| <b>MOLLUSCA: GASTROPODS</b>         |             |            |        |                  |
| <i>Amphithalamus falsestea</i>      |             | o          |        |                  |
| <i>Amphithalamus ornatus</i>        |             | o          |        |                  |
| <i>Anabathron hedleyi</i>           | f           | f          |        |                  |
| <i>Anabathron ovatus</i>            | r           |            |        |                  |
| <i>Astraea heliotropium</i>         |             | d          |        |                  |
| <i>Atalacmea fragilis</i>           |             | f          | o      |                  |
| <i>Austromitra rubiginosa</i>       | d           |            |        |                  |
| <i>Brookula polyleura</i>           |             | r          |        |                  |
| <i>Cabestana spengleri</i>          |             | d          |        |                  |
| <i>Caecum digitulum</i>             |             | f          |        |                  |
| <i>Cantharidella tesselata</i>      | o           | f          |        |                  |
| <i>Cellana ornata</i>               | o           | f          | f      |                  |
| <i>Cellana radians</i>              | f           | f          | f      |                  |
| <i>Certhiopsidae</i>                |             | d          |        |                  |
| <i>Charonia lampas</i>              | dd          | d          | d      |                  |
| <i>Chemnitzia kingi?</i>            | r           | r          |        |                  |
| <i>Cominella virgata</i>            | d           |            |        |                  |
| <i>Cookia sulcata</i>               | o           | o          | d      |                  |
| <i>Crassitonella carinata</i>       | d           | d          |        |                  |
| <i>Crosseola vesca</i>              |             | d          |        |                  |
| <i>Dicathais orbita</i>             | o           | o          | d      |                  |
| <i>Diloma arida</i>                 | c           | c          | c      |                  |
| <i>Diloma bicanaliculata</i>        | r           | f          | o      |                  |
| <i>Diloma zelandica</i>             | o           |            |        |                  |

|                                  | Landing<br>Bay | Picnic<br>Bay | NW<br>Bay | Scott's<br>Monument |
|----------------------------------|----------------|---------------|-----------|---------------------|
| <i>Eatoniella albocolumella</i>  | c              | c             |           |                     |
| <i>Eatoniella atropurpurea</i>   |                | o             |           |                     |
| <i>Eatoniella dellii</i>         | r              |               |           |                     |
| <i>Eatoniella latebricola</i>    |                | d             |           |                     |
| <i>Eatoniella mortoni</i>        | r              | d             |           |                     |
| <i>Eatoniella notalabia</i>      | c              | c             |           |                     |
| <i>Eatoniella olivacea</i>       | c              | c             |           |                     |
| <i>Eatoniella pfefferi</i>       | c              | c             | f         |                     |
| <i>Eatoniella roseocincta</i>    | r              | o             |           |                     |
| <i>Eatoniella roseola</i>        |                | d             |           |                     |
| <i>Eatonina atomaria</i>         |                | r             |           |                     |
| <i>Eatonina micans</i>           |                | r             |           |                     |
| <i>Eatonina subflavescens</i>    |                |               | r         |                     |
| <i>Fictonoba carnosa carnosa</i> | d              | d             | d         |                     |
| <i>Fictonoba rufolactea</i>      |                | o             |           |                     |
| <i>Gadinia conica</i>            |                | d             |           |                     |
| <i>Haliotis iris</i>             | dd             | o             | d         |                     |
| <i>Haustrum haustorium</i>       | d              | r             | r         |                     |
| <i>Herpetopoma bella</i>         | d              | d             |           |                     |
| <i>Incisura lytteltonensis</i>   | o              | c             | o         |                     |
| <i>Incisura rosea</i>            | f              | c             |           |                     |
| <i>Lepsiella scobina</i>         | f              | f             | o         |                     |
| <i>Lodderena formosa</i>         |                | d             |           |                     |
| <i>Lodderia iota</i>             |                | r             |           |                     |
| <i>Melagraphia aethiops</i>      | d              | r             | r         |                     |
| <i>Melanella</i> sp.             |                | d             |           |                     |
| <i>Merelina compacta</i>         |                | d             |           |                     |
| <i>Merelina taupoensis</i>       | d              | d             |           |                     |
| <i>Monophorus fascelina</i>      |                | r             |           |                     |
| <i>Munditia serrata?</i>         |                | r             |           |                     |
| <i>Muricopsis octogonus</i>      | d              |               |           |                     |
| <i>Nerita atramentosa</i>        | a              | a             | a         |                     |
| <i>Nodilittorina antipoda</i>    | f              | f             | c         |                     |
| <i>Notoacmea elongata</i>        |                | o             |           |                     |
| <i>Notoacmea pileopsis</i>       | f              | f             | o         |                     |
| <i>Notoacmea scopulina</i>       | o              | d             | o         |                     |
| <i>Nozeba emarginata</i>         |                | d             |           |                     |
| <i>Odostomia</i> sp.             |                | d             |           |                     |
| <i>Onoba fumata</i>              |                | r             |           |                     |
| <i>Orbitestella parva</i>        |                | r             |           |                     |
| <i>Patelloida corticata</i>      | o              | f             | f         |                     |
| <i>Peculator hedleyi</i>         |                | d             |           |                     |
| <i>Pisinna olivacea impressa</i> | d              | f             |           |                     |
| <i>Pisinna semiplicata</i>       |                | d             |           |                     |
| <i>Pisinna zosterophila</i>      | o              | o             |           |                     |
| <i>Powellisetia unicarinata</i>  |                | d             |           |                     |
| <i>Powellisetia subgradata</i>   |                | d             |           |                     |
| <i>Pusillina hamiltoni</i>       | o              |               |           |                     |
| <i>Pusillina mobilicosta</i>     |                | o             |           |                     |
| <i>Ranella australasia</i>       | d              |               | d         |                     |
| <i>Risellopsis varia</i>         | o              | d             | d         |                     |
| <i>Rissoella cystophora</i>      | o              | c             |           |                     |
| <i>Rissoella elongatospira</i>   |                | r             |           |                     |
| <i>Rissoella flemingi</i>        |                | r             |           |                     |
| <i>Rissoina chathamensis</i>     | d              | d             |           |                     |
| <i>Sagenotriphora ampulla</i>    |                | d             |           |                     |
| <i>Serpulorbis</i> spp.          |                | o             |           |                     |
| <i>Sinezona brevis</i>           |                | f             |           |                     |
| <i>Sinezona laqueus</i>          |                | r             |           |                     |
| <i>Sinezona levigata</i>         |                | o             |           |                     |
| <i>Sinuginella</i> sp.           |                | d             |           |                     |
| <i>Siphonaria australis</i>      | o              | f             | o         |                     |
| <i>Stephanopoma rosea</i>        |                | d             |           |                     |
| <i>Suterilla neozelanica</i>     |                | r             |           |                     |
| <i>Taron dubius</i>              | o              |               |           |                     |
| <i>Thoristella oppressa</i>      | d              | r             |           |                     |
| <i>Trochus tiaratus</i>          |                | d             |           |                     |
| <i>Tugali suteri</i>             |                | d             |           |                     |
| <i>Turbo smaragdus</i>           | d              | r             | r         |                     |
| <i>Xymene traversi</i>           | f              |               |           |                     |
| <i>Zaclys murdochii</i>          |                | d             |           |                     |
| <i>Zalipais lissa</i>            |                | o             |           |                     |

|                                      | Landing<br>Bay | Picnic<br>Bay | NW<br>Bay | Scott's<br>Monument |
|--------------------------------------|----------------|---------------|-----------|---------------------|
| <i>Zemitrella fallax</i>             |                | d             |           |                     |
| <i>Zemitrella stephanophora</i>      | d              |               |           |                     |
| MOLLUSCS: BIVALVES                   |                |               |           |                     |
| <i>Arthritica bifurca</i>            |                | d             |           |                     |
| <i>Borniola reniformis</i>           | d              | d             |           |                     |
| <i>Cardita aoteana</i>               |                | d             |           |                     |
| <i>Chlamys zelandiae</i>             | d              | d             |           |                     |
| <i>Condylocuna concentrica</i>       |                | d             |           |                     |
| <i>Cosa serratocostata</i>           |                | d             |           |                     |
| <i>Felaniella zelandica</i>          |                | d             |           |                     |
| <i>Hiatella arctica</i>              | o              | o             | o         |                     |
| <i>Kidderia costata</i>              |                | d             |           | f                   |
| <i>Lasaea hinemoa</i>                | o              | o             |           |                     |
| <i>Myadora</i> sp.                   |                | d             |           |                     |
| <i>Myllita stowei</i>                |                | d             |           |                     |
| <i>Neolepton antipodum</i>           |                | o             |           |                     |
| <i>Philobrya acutangula</i>          | d              |               |           |                     |
| <i>Philobrya</i> cf. <i>modiolus</i> | c              | d             | c         |                     |
| <i>Philobrya munita</i>              | c              | c             | c         |                     |
| <i>Saccostrea cucullata</i>          |                | r             |           |                     |
| <i>Trichomusculus barbatus</i>       | o              | d             |           |                     |
| MOLLUSCS: CEPHALOPODS                |                |               |           |                     |
| <i>Nototodarus sloanii</i>           |                | r shoal       |           |                     |
| ECHINODERMS                          |                |               |           |                     |
| <i>Centrostephanus rodgersi</i>      |                |               |           |                     |
| <i>Evechinus chloroticus</i>         | f              | f             | o         |                     |
| <i>Ophioneris fasciata</i>           |                |               | d         |                     |
| <i>Ophiopteris antipodum</i>         |                | r             |           |                     |
| <i>Patiriella regularis</i>          |                | r             | r         |                     |
| purple spined echinoid               | d              | d             | d         |                     |
| CRUSTACEA                            |                |               |           |                     |
| <i>Alope spinifrons</i>              |                | r             |           |                     |
| <i>Cyclograpsus lavauxi</i>          |                | o             | o         |                     |
| <i>Elamena producta</i>              |                | o             |           |                     |
| <i>Halicarcinus cookii</i>           |                | o             |           |                     |
| <i>Halicarcinus pubescens</i>        |                | o             |           |                     |
| <i>Hemigrapsus edwardsi</i>          |                | o             |           |                     |
| <i>Heterozius rotundifrons</i>       |                | o             |           |                     |
| <i>Leptograpsus variegatus</i>       |                | f             |           |                     |
| <i>Ozius truncatus</i>               |                | o             |           |                     |
| <i>Pagurus</i> sp.                   | o              |               |           |                     |
| <i>Petrolisthes elongatus</i>        |                | o             | r         |                     |
| <i>Plagusia chabrus</i>              | o              | r             |           |                     |
| <i>Balanus trigonus</i>              |                | r             |           |                     |
| <i>Chamaesipho brunnea</i>           | f              | c             | c         |                     |
| <i>Chamaesipho columna</i>           |                | c             | c         |                     |
| <i>Epopella plicata</i>              | f              | f             | f         |                     |
| <i>Tetraclitella depressa</i>        |                | o             |           |                     |
| Isopods                              | c              | c             | c         |                     |
| Amphipods                            | c              | c             | c         |                     |
| POLYCHAETES                          |                |               |           |                     |
| <i>Hydroides norvegicus</i>          |                | o             |           |                     |
| <i>Perinereis amblyodonia</i>        |                | o             | r         |                     |
| <i>Perenereis camiguinoides</i>      |                | r             |           |                     |
| <i>Salmacina australis</i>           | o              |               |           |                     |
| <i>Spirorbis</i> sp.                 | c              | o             |           |                     |
| COELENTERATES                        |                |               |           |                     |
| <i>Actinia tenebrosa</i>             |                | o             | r         |                     |
| <i>Actinothoe albocincta</i>         | o              |               | o         |                     |
| <i>Cricophorus nutrix</i>            | o              |               |           |                     |
| BRYOZOANS                            |                |               |           |                     |
| <i>Beania</i> sp.                    | c              |               |           |                     |
| SPONGES                              |                |               |           |                     |
| <i>Ancorina alata</i>                | o              |               |           |                     |
| <i>Tethya aurantium</i>              |                | o             |           |                     |
| red encrusting sponge                |                | f             |           |                     |
| ASCIDIANS                            |                |               |           |                     |
| <i>Asterocarpa coerula</i>           |                | r             |           |                     |
| <i>Cnemidocarpa bicornuata</i>       |                | r             |           |                     |
| <i>Pyura</i> sp.                     |                | o             |           |                     |

|                                    | Landing<br>Bay | Picnic<br>Bay | NW<br>Bay | Scott's<br>Monument |
|------------------------------------|----------------|---------------|-----------|---------------------|
| <b>ALGAE</b>                       |                |               |           |                     |
| <i>Apophlaea sinclairii</i>        | c              | c             | c         | J                   |
| <i>Arthrocardia corymbosa</i>      |                |               |           | J                   |
| <i>Asparagopsis armata</i>         |                |               |           | J                   |
| <i>Carpophyllum angustifolium</i>  | f              | f             | f         | J                   |
| <i>Carpophyllum maschalocarpum</i> | f              | f             |           | J                   |
| <i>Carpophyllum plumosum</i>       | f              | o             |           | J                   |
| <i>Catenella fusiformis</i>        |                |               |           | J                   |
| <i>Chaetomorpha coliformis</i>     | o              |               |           |                     |
| <i>Champia laingii</i>             |                |               |           | J                   |
| <i>Cheilosporum sagittatum</i>     |                |               |           | J                   |
| <i>Colpomenia sinuosa</i>          |                |               |           | J                   |
| <i>Corallina officinalis</i>       |                | c             | c         |                     |
| <i>Cystophora retroflexa</i>       |                |               |           | J                   |
| <i>Dasyclonium incisum</i>         |                |               |           | J                   |
| <i>Dictyota ocellata</i>           |                |               |           | J                   |
| <i>Ecklonia radiata</i>            | f              | f             | f         | J                   |
| <i>Gelidium caulacantheum</i>      |                |               |           | J                   |
| <i>Glossophora kunthii</i>         |                |               |           | J                   |
| <i>Halopteris paniculata</i>       |                |               |           | J                   |
| <i>Halopteris virgata</i>          |                |               |           | J                   |
| <i>Hymenena multipartita</i>       |                |               |           | J                   |
| <i>Leathesia difformis</i>         |                |               |           | J                   |
| <i>Lessonia variegata</i>          | f              | o             | o         | J                   |
| " <i>Lithothamnium</i> " sp.       |                |               |           | J                   |
| " <i>Lithophyllum</i> " sp.        |                |               |           | J                   |
| <i>Melanthalia abscissa</i>        |                |               |           | J                   |
| <i>Osmundaria colensoi</i>         | f              | f             | d         | J                   |
| <i>Petalonia fascia</i>            |                |               |           | J                   |
| <i>Plocamium angustum</i>          |                |               |           | J                   |
| <i>Porphyra columbina</i>          |                |               |           | J                   |
| <i>Prasiola stipitata</i>          | o              |               |           |                     |
| <i>Pterocladiella capillacea</i>   |                |               |           | J                   |
| <i>Pterocladia lucida</i>          |                |               |           | J                   |
| <i>Sargassum sinclairii</i>        |                |               |           | J                   |
| <i>Spatoglossum chapmanii</i>      |                |               |           | J                   |
| <i>Splachnidium rugosum</i>        |                | f             |           |                     |
| <i>Stictosiphonia gracilis</i>     |                |               |           | J                   |
| <i>Tenarea carpophyllii</i>        | f              |               |           |                     |
| <i>Ulva lactuca</i>                | a              | a             | a         | J                   |
| <i>Xiphophora chondrophylla</i>    | c              | a             | c         | J                   |
| <i>Xiphophora gladiata</i>         |                | o             |           |                     |
| <i>Zonaria turneriana</i>          |                |               |           | J                   |
| <b>FISH</b>                        |                |               |           |                     |
| <i>Trachelochismus pinnulatus</i>  | o              |               |           |                     |

### COMPARISON BETWEEN THE EXPOSED INTERTIDAL COASTS, EAST AND WEST OF NORTHERN NEW ZEALAND

The shores of Cuvier Island must be among the most exposed on the east side of northern New Zealand. It is interesting to compare their intertidal biota with that of the most exposed rocky shores on the west coast of northern New Zealand at similar latitudes along the coast of the Waitakere Ranges (e.g. Hayward and Morley, in press). The most obvious differences are at mid and low tide levels where the dominant organism on Cuvier Island is *Nerita atramentosa*, which is rare on the Waitakere's west coast. This may be a result of the slightly warmer sea water temperatures in the East Auckland Current that sweeps southward down the east coast. Three of the most common low tidal-shallow subtidal seaweeds at Cuvier, *Carpophyllum angustifolium*, *Ecklonia radiata* and *Xiphophora chondrophylla* are also extremely rare or absent on the Waitakere's coast. Also absent from the Waitakere's coast is *Charonia lampas*, which is the most prominent shell washed-up on Cuvier's boulder beaches.

In contrast, a number of the most abundant and characteristic animals and plants on the exposed shores of the Waitakeres were not recorded by us during our brief survey of Cuvier shores. These include the green-lipped mussels *Perna canaliculus* and the flea mussel *Xenostrobus pulex*, both of which form extensive beds covering large areas of the rocky shore; one of their major predators, the large orange starfish *Stichaster australis*; the larger brown periwinkle *Nodilittorina cincta*; the whelks *Cominella maculosa* and *Buccinulum linea*; and the bull kelp *Durvillaea antarctica*. Both *Perna* and *Xenostrobus* are present however, although not often in high densities, on the coasts of Coromandel Peninsula and Great Barrier Island on the east coast.

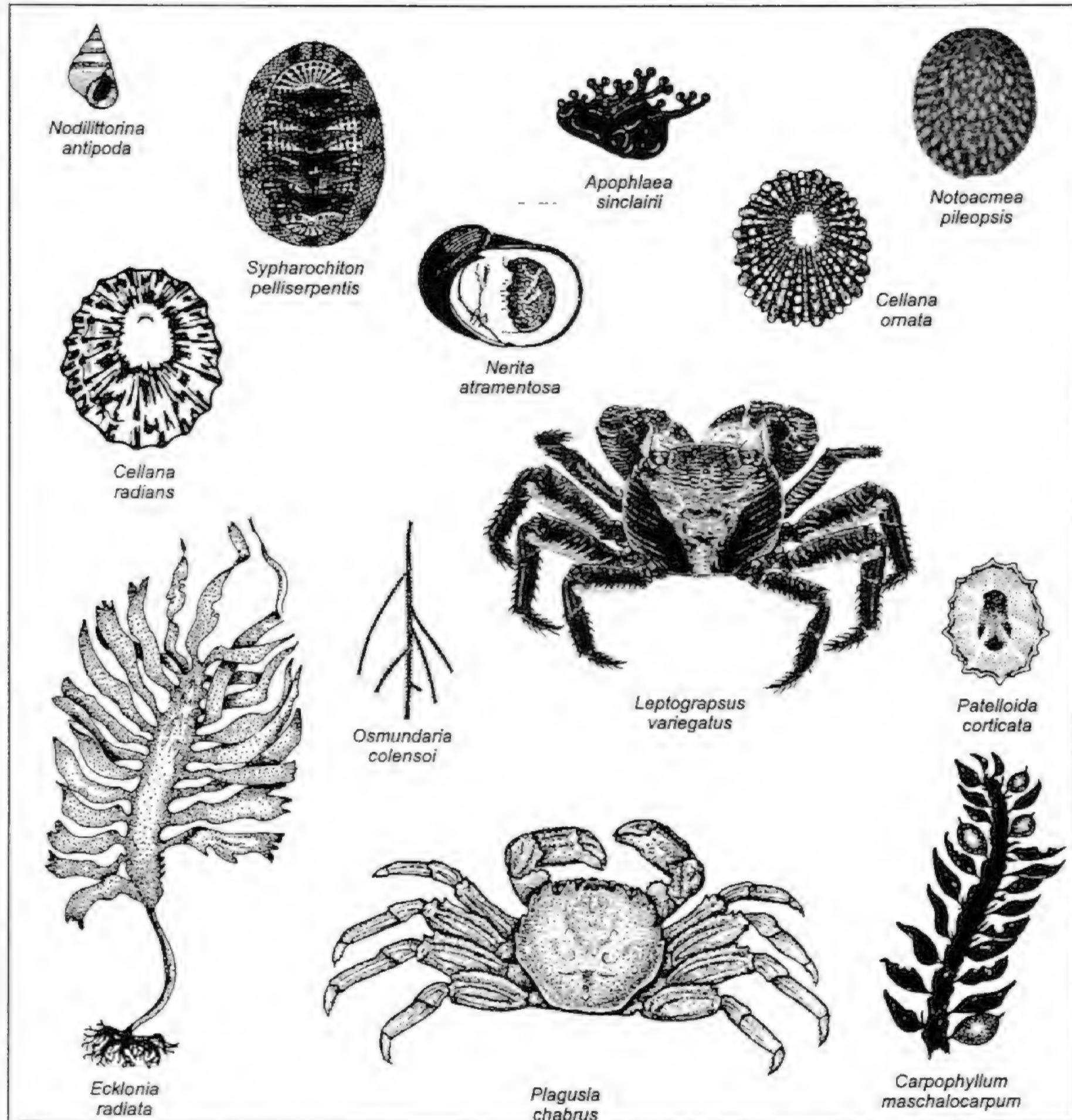


Fig. 2. Some of the common intertidal species at Cuvier Island.

Similarities in the dominant zoning organisms of the exposed east and west coasts can be found in the three barnacles *Chamaesipho brunnea*, *C. columnna*, *Epopella plicata*, the high tidal limpet *Notoacmea pileopsis* and periwinkle *Nodilittorina antipoda*, the large grapsid rock crabs *Leptograpsus variegatus* and *Plagusia chabrus*, the limpets *Cellana ornata*, *C. radians*, and *Patelloidea corticata*, the snakeskin chiton *Sypharochiton pelliserpentis*, and seaweeds *Apophlaea sinclairii*, *Carpophyllum maschalocarpum*, and *Osmundaria colensoi* (Fig. 2).

Our observations suggest that the red seaweed *O. colensoi* is more common at Cuvier, where it forms a zone just below low tide, than on the west coast. The small bivalve, *Gaimardia finlayi* attaches to fronds of *Osmundaria* on the Waitakere's coast, but none were found in this survey at Cuvier.

In sharp contrast to the low diversity of intertidal macro-molluscs at Cuvier, microscopic molluscs obtained from intertidal and shallow subtidal algal washes are rich and diverse. They comprise more than 80 species of the 121 total. Species present at Cuvier and recorded elsewhere only in the north of the North Island (and not along the Waitakere west coast) include *Amphithalamus ornatus*, *Crassitonella carinata*, *Fictonoba rufolactea*, *Lodderena formosa*, *Merelina compacta*, *Munditia serrata*, *Powellisetia unicarinata*, and *Zemitrella stephanophora*.

### OTHER OBSERVATIONS ON CUVIER ISLAND BIOTA

Low numbers of the limpet *Notoacmea scopulina* were found on high tidal rocks. A single specimen of the large chiton, *Plaxiphora obtecta*, was found on low tidal rocks at Picnic Bay during the short survey. *Sypharochiton pelliserpentis* at Landing Bay live in crevices almost up to the splash zone as well as at high tide. In the crevices above these chitons are numerous periwinkles, *Nodilittorina antipoda*.

The small bivalves, *Philobrya* cf. *modiolus* and *P. munita*, were present attached to fronds at the base of the red low tidal and shallow subtidal seaweeds, *Osmundaria colensoi* and *Melanthalia abscissa* holdfasts. Living in the algae are numerous crustacea such as isopods, amphipods and ostracods. Dark crimson sheets of the bryozoan *Beania* and small ascidians *Pyura* are attached to the *Carpophyllum maschalocarpum* holdfasts, whereas pink rosettes of the calcareous algae *Tenarea carpophylli* encircle its fronds. The small anemone *Cricophorus nutrix* is present attached to the fronds of the brown alga *Carpophyllum augustifolium*.

Shaded areas of high tidal rocks are covered in a short, dark turf, composed of *Gigartina chapmanii*, *Chaetomorpha aerea*, *C. coliformis*, *Jania miroarthrodia*, and a red epiphytic alga. At the base of these algae are occasional small gastropods, *Risellopsis varia*.

A shoal of juvenile squid *Nototodarus sloanii* swam in the shallows off the steps at Landing Bay.

### EXTENSIONS OF BIOGEOGRAPHIC RANGE

*Lodderia iota* Powell, 1940

This microscopic gastropod found in low tidal shell gravel at Picnic Bay, Cuvier, extends the range of this species southwards. Previous records are off Rangaunu and Doubtless Bays, Northland dredged in depths of 20 m (Powell, 1979). We also know of records from the Waitakere coast; Bay of Islands; Poor Knights Islands; Mokohinau Islands and Devonport, Waitemata Harbour (Auckland War Memorial Museum collections).

*Eatoniella latebricola* Ponder, 1965

Previously recorded from *Durvillaea* holdfasts on the west coast of Auckland (Powell, 1979). This dead specimen from Picnic Bay requires confirmation. The likely habitat is under algal holdfasts such as *Ecklonia radiata*, since *Durvillaea* was not found at Cuvier in an algae survey in 1968, nor in this brief study. The range is further extended by dead specimens from depths of 30 m from Shag Bay, Tawhiti Rahi, Poor Knights, and in the intertidal at Jackson Bay, South Island (Morley collection). Additional west coast records south of Auckland are from New Plymouth and Raglan (Auckland War Memorial Museum collections).

*Chaetomorpha coliformis*

Small specimens of this beaded green alga were found among *Gigartina chapmanii* in a high tidal turf. Previous records are from the southern part of the North Island (Adams 1994).

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# GRAFTON GULLY

## A HOME FOR NATIVE AND INTRODUCED LANDSNAILS AND SLUGS

(Including Freshwater Snails)

by Bruce F. Hazelwood, David J. Roscoe, Frank Boulton

### Abbreviations

|            |   |
|------------|---|
| (A.M.)     | Auckland Museum                                     |
| (M.N.Z.)   | Museum of New Zealand, Wellington.                  |
| (B.F.H.)   | Bruce Fraser Hazelwood                              |
| regen.     | Regenerating  |
| indet.     | Unidentified  |
| Pers. Com. | Personal communication                              |
| ICZN       | International Commission of Zoological Nomenclature |
| det.       | Detected  |

### Grafton Gully, Symonds Street Cemetery

Grafton Gully is situated on Symonds Street Auckland City, an area divided by Grafton Bridge. The Symonds Street Cemetery<sup>1</sup> occupies the upper slopes (east side), also a section on the west, bordering Karangahape Road. The latter is a typical well kept, European cemetery. Native vegetation here appears to have been planted. On the eastern side the upper grave area is tidy, the lower level, however, is overgrown, but still sustains a sizeable landsnail fauna. Introduced ivy, *Hedera helix*; wild onion plants, *Allium triquetrum*, and various bulbs (including jonquils, daffodils) also *Agapanthus sp.* are present. Ivy is encroaching on the bush<sup>2</sup>, this must be halted! Pohutukawa trees, *Metrosideros excelsa*, line the boundary with Symonds Street and Oak trees, *Quercus robur*, are scattered through the reserve. A few Pine trees, *Pinus sp.* are present, these must be removed! Note - Skin can be sensitive to Ivy, the main symptom being severe irritation! Grafton Bridge divides the gully, the northern side is very open, planted mainly with introductions, e.g., Oak, *Quercus robur*. Some natives are present, Kawakawa, *Macropiper excelsum f. excelsum* is spreading. Tracks meander through the graveyard and gully. When walking down to the gully, one is struck by the size of some leaves that carpet the ground, these are Morton Bay Fig, *Ficus macrophylla*, and *Magnolia grandiflora*. On the north boundary, introduced ferns, *Nephrolepsis cordifolia*, line the track for a short distance, they provide a compatible habitat for native landsnails. *Blechnum* Ferns should be planted in similar situations. Below here, the introduced weed mistflower, *Ageratina riparia*, is taking hold. Note: mistflower is spreading through the cemetery and gully.

Wandering Jew, *Tradescantia fluminensis*, has a moderate presence. This is a habitat which produces a perfect refuge for snails but, when carpeted through the bush, does not allow seedlings to sprout. Usually a rampant weed.

At the bottom some native vegetation survives, here are some we noticed: Kawakawa, *Macropiper excelsum f. excelsum*; Pigeonwood, *Hedycarya arborea*; Mahoe, *Melicytus ramiflorus*; *Coprosma* spp. and some tree ferns. Wandering Jew, *Tradescantia fluminensis*, covers the ground - a good spot for snails!

**South of the bridge -this divides into three basic regions**

1. **Above Top Track** — Cemetery   *Camellia* sp., *Coprosma* spp and a *Hebe* sp.,<sup>3</sup> Ivy, Wild Onion Plant and various bulbs.
2. **Between Top Track and Grave Track** — Cemetery — Regenerating.
3. **Between Grave Track and Lower Track** — Bush — also a flat grassy strip paralleled by a tiny stream. Here are some of the more obvious trees and plants seen:

<sup>1</sup>Symonds Street Cemetery serviced the needs of Auckland City in the 1800s. Most burials took place between 1842 and 1886. Captain William Hobson is buried here, died 10th September, 1843. Aged 49 years. He was New Zealand's first Governor.

<sup>2</sup> Native forest.

<sup>3</sup> *Hebe* sp. Introduced when replanting - not an Auckland species.

|              |  |             |                              |
|--------------|--|-------------|------------------------------|
| Mamaku Fern  | <i>Cyathea medullaris</i>              | Silver Fern | <i>Cyathea dealbata</i>      |
| Kawakawa     | <i>Macropiper excelsum f. excelsum</i> | Kohekohe    | <i>Dysoxylum spectabile</i>  |
| Mahoe        | <i>Melicytus ramiflorus</i>            | Titoki      | <i>Alectryon excelsus</i>    |
| Pateite      | <i>Schefflera digitata</i>             | Rangiora    | <i>Brachyglottis repanda</i> |
| Cabbage tree | <i>Cordyline australis</i>             | Pigeonwood  | <i>Hedycarya arborea</i>     |
| Rewarewa     | <i>Knightia excelsa</i>                |             | <i>Coprosma spp.</i>         |
| Karaka       | <i>Corynocarpus laevigatus</i>         |             |                              |

The opposite bank is barren with few native trees planted, exotics prevail. The southern end of the Grave Track is devoid of graves. This spot has been cleared in the past, but is now regenerating. Native trees, ferns and other plants are establishing. Replanting in this area is most desirable!

In this present investigation it was hoped that sampling of different vegetation types from the lower levels of Grafton Gully would indicate which species of snails and slugs were still present. Samples at locations north and south of the bridge, in the gully and from grave sites, show distribution patterns and abundance, as well as species living in various combinations — sympatry<sup>4</sup>. Also shows which native snails adapt best to this modified environment. Samples averaged 2.5 litres per bag. After collecting the first four samples from grave sites, I (B.F.H.) became aware that collecting more of these samples could prove interesting, not only for introduced snails and slugs, but also to see how native species were coping. Choosing of sites was done by selecting plots covered with vegetation and which displayed legible inscriptions on their tombstones. Most of these sites are surrounded by some form of perimeter fence, and collecting was done generally within this boundary. Low-lying vegetation was cleared, most being Ivy, Mistflower, various bulbs and some Wandering Jew. Coarse litter, Oak especially, was then removed from the surface, the fine material, a layer approximately 10mm deep was scooped up and placed in plastic bags. This was taken home, dried, sieved and finally sorted under strong light with the aid of magnification. The early sorting of samples — Grafton Gully and the first four grave sites was done by D. J. Roscoe using the flotation method<sup>5</sup>. Jim Goulstone also sorted a few samples. The subsequent material was done by B. F. Hazelwood using the dry method<sup>6</sup>.

The biggest proportion of graves leave no trace of their existence, totally overgrown with Ivy or other introduced cover. Species of native trees, ferns and plants are slowly recolonising this exotic<sup>7</sup> environment, native snails still live here! The lower levels of the graveyard should be left to regenerate, thereby supplying sustainable habitat for native snails, spiders, beetles and other insects. Selection of sites, except those from graves was deliberate, collecting mainly from under large trees and habitats which produce good leafmould.

E.g. Silver Fern, Mamaku Fern, Mahoe, Karaka, Kawakawa, Kohekohe, *Coprosma spp.*, *Carex* grass, Oak, Pinoak, *Quercus palustris*; Morton Bay Fig, *Ficus macrophylla*; Port Jackson Fig, *Ficus rubiginosa*, and Wandering Jew.

- Three samples were collected beside the motorway onramp, to see what native snails survive after replanting. One of these sites was on the opposite bank, alongside the motorway.
- Two samples were collected from the cemetery, western side of Symonds Street alongside Karangahape Road, for comparison.
- One sample (Grave Track) to show impact of Pine Trees, *Pinus sp.* (Collected from grave site)
- One sample (Grave Track) Regenerating Bush.

#### Suggested Replanting Strategies

Replanting of natives in the gully needs to be continued. Consultation between City Council, City Park Staff, Botanical Specialists, Forest and Bird Protection Society, Landcare Research and

<sup>4</sup> Sympatry - living side by side with no interbreeding.

<sup>5</sup> Flotation Method - litter is placed in water, washed in sieve - empty shells float to surface. Live snails then sink and these are sorted dry. Sorting done under strong light using some magnification.

<sup>6</sup> Dry Method - litter is dried and sieved. Again use strong light and some magnification.

<sup>7</sup> Exotic - Not native, originating elsewhere!

interested parties will be required to formulate a plan as to how this can be best accomplished. A plan has been implemented, but lack of money, resources and manpower limit what can be achieved. One periodic detention gang operates each Saturday, though not always at Grafton Gully. Replanting is carried out in winter to avoid harsh, dry conditions and the constant need for watering. Seedlings come from a local nursery.

It is interesting to note that only one Taraire, *Beilschmiedia tarairi*<sup>8</sup>, survives. This species used to dominate the gully. Taraire should be replanted together with Puriri, *Vitex lucens*, which occur together, naturally. Taraire/Puriri litter is excellent for native snails and arthropoda<sup>9</sup>.

- A) Native ferns must be replanted in typical habitats.
- B) Use only plants that live naturally in the Auckland Region.
- C) Do not use cultivated hybrids.
- D) Select only seedlings and plants that come from the Auckland gene pool.

### Suggested Stock for Replanting

#### Marginal Sites

|               |                                |                     |                                |
|---------------|--------------------------------|---------------------|--------------------------------|
| Taupata,      | <i>Coprosma repens</i>         | Wineberry, Makomako | <i>Aristotelia serrata</i>     |
| Matipo, Mapou | <i>Myrsine australis</i>       | Manuka              | <i>Leptospermum scoparium</i>  |
| Kanuka        | <i>Leptospermum ericoides</i>  | Lemonwood, Tarata   | <i>Pittosporum eugenioides</i> |
| Karaka        | <i>Corynocarpus laevigatus</i> | Houhere, Lacebark   | <i>Hoheria populnea</i>        |
| Putaputaweta  | <i>Carpodetus serratus</i>     |                     |                                |

#### Ferns

|                            |                           |                                    |
|----------------------------|---------------------------|------------------------------------|
| Silver fern, Ponga         | <i>Cyathea dealbata</i>   | Various Ferns                      |
| Mamaku Fern, Mamaku, Korau | <i>Cyathea medullaris</i> | Blechnum Ferns <i>Blechnum spp</i> |

#### Trees and Plants

|                            |  |              |                                 |
|----------------------------|--|--------------|---------------------------------|
| Rimu                       | <i>Dacrydium cupressinum</i>           | Kahikatea    | <i>Dacrycarpus dacrydioides</i> |
| Tawa                       | <i>Beilschmiedia tawa</i>              | Taraire      | <i>Beilschmiedia tarairi</i>    |
| Puriri                     | <i>Vitex lucens</i>                    | Mahoe        | <i>Melicytus ramiflorus</i>     |
| Pigeonwood, Porokaiwhiri   | <i>Hedycarya arborea</i>               | Rewarewa     | <i>Knightia excelsa</i>         |
| Kohekohe                   | <i>Dysoxylum spectabile</i>            | Kowhai       | <i>Sophora microphylla</i>      |
| Kauri                      | <i>Agathis australis</i>               | Kohuhu       | <i>Sophora tetraptera</i>       |
| Hinau                      | <i>Elaeocarpus dentatus</i>            | Cabbage Tree | <i>Pittosporum tenuifolium</i>  |
| Rangiora                   | <i>Brachyglottis repanda</i>           | Nikau        | <i>Cordyline australis</i>      |
| Kawakawa                   | <i>Macropiper excelsum f. excelsum</i> | Flax         | <i>Rhopalostylis sapida</i>     |
| <i>Coprosma nsp</i>        | <i>Coprosma spp (aff macrocarpa)</i>   |              | <i>Phormium tenax</i>           |
| <i>Tree Coprosma</i>       | <i>Coprosma arborea</i>                |              |                                 |
| <i>Big leafed Coprosma</i> | <i>Coprosma grandifolia</i>            |              |                                 |
| <i>Shining Coprosma</i>    | <i>Coprosma lucida</i>                 |              |                                 |
| <i>Robust Coprosma</i>     | <i>Coprosma robusta</i>                |              |                                 |

#### Grasses

|                        |                          |
|------------------------|--------------------------|
| <i>Astelia banksii</i> | <i>Astelia solandrii</i> |
| <i>Carex spp.</i>      | <i>Gahnia lacera</i>     |

#### Notes

1. Both species of Privet, *Ligustrum sinense* and *Ligustrum lucidum*, are being eradicated.
2. Pine Trees, their dead trunks, branches and needles, need to be removed.
3. Mistflower is a weed and should be kept in check.
4. Ivy must be sprayed where it encroaches on the bush. Leave well alone in the lower grave area, to avoid destroying this habitat. Leave this area to regenerate!
5. Wandering Jew should be left alone until a replanting program is in progress. This is the best habitat for native snails and will repopulate the gully.
6. At a wet spot above the Grave Track, Parataniwha, *Elatostema rugosum*, is present and is spreading. Small *Punctids* and *Potamopyrgus sp.* will colonise this area.
7. Replanting above the Grave Track is desirable!
8. Replanting on the east bank should be undertaken
9. An area above the Grave Track, just below a number of vaults is very soggy in winter and would be perfect to plant swamp species. E.g. Pukatea, swamp Maire, Kahikatea, Flax and Grass Sedges. Parataniwha has colonised this spot.

<sup>8</sup> Note spelling difference between the English/Maori word taraire and its Latin equivalent in *Beilschmiedia tarairi*.

<sup>9</sup> Arthropoda include insects, centipedes, millipedes, spiders (and crustacea).

## Restoration of Symonds Street Cemetery

A decision by the Auckland City Council to upgrade the cemetery has been approved. Especially the lower levels which are overgrown. These areas, however, are regenerating with native vegetation and sustain a sizeable landsnail fauna. Graves will be repaired, the fallen headstones put back in place and the ground planted with grass. Hopefully natives will be allowed to regenerate. I fear that these improvements and beautification will render these areas sterile to native fauna and flora.

As of March 2001, work was well under way. Periodic detention gangs, plus council workers were in the process of systematically removing all vegetation both native and introduced. Excepting large trees and bushes. The method of removal is by cutting vegetation to ground level, using petrol-driven weed-eaters and then repeated spraying of the entire area with herbicide. Natives are starting to push through again. To my knowledge no native plants have been saved for replanting.

### Further Reading:

Bio-control of Mistflower - *Ageratina riparia* Media Release 13/12/1999

The mistflower gall fly - *Procecidochares alani* Media Release 28/3/2001

### For more information contact

Dr Jane Fröhlich  
Landcare Research  
Mt Albert  
Ph 09 8493660

Mr Lance Vervoort  
Team Leader, Biosecurity  
Auckland Regional Council  
Ph 09 3739962

Andrew Wilke,  
ARC Biosecurity Officer  
Ph 09 366-2000 Ext.8775

## Historical Records

As a landsnail site, Grafton Gully has been known to collectors, bird watchers and botanists since the early nineteenth century. It seems strange that Dr. Powell and Henry Suter had not collected here. No specimens have been found in either collection. Few specimens remain in Museum Collections, only seven lots are known, plus one sample collected by Norm Gardner, which is in his private collection. Most of this locality lot are lost!

The following text by Norm Gardner is reprinted from *Poirieria*  
Vol 3, Part 4/5, September/December 1966.

## METROPOLITAN LAND SNAIL COLLECTING

"One would scarcely expect to be able to indulge in land snail collecting within a very short distance of Auckland's busy Queen St; however, this can be done in Grafton Gully, just below the massive concrete bridge tower on the Symonds St. Bank.

"Here, a tiny area of mature vegetation is undisturbed, though invaded to some extent by exotics such as oak, *Pinus* and wandering jew. Much of the opposite bank has recently been cleared for motorway construction and even this tiny area is very close to the road machines.

"In leaf mould and under rocks beneath ponga tree ferns and Kawakawa a notable small land snail colony exists. Some species occur quite plentifully.

"The following 16<sup>10</sup> species, collected on a recent hunt are:-

### Operculates:-

*Liarea egea* (Gray)  
*Cyrtora hedleyi* (Suter)

*Cyrtora torquilla* (Suter)

### New Names

### *Flammulinidae* was represented by:-

*Thalassohelix zigzag* (Gould)

*Therasiella tamora* (Hutton)

*Suteria ide* (Gray)

*Flammulina costulata* (Suter)

*Flammocharopa costulata*

### Charopid members were:-

*Ptychodon pseudoleioda* (Suter)

*Huonodon pseudoleioda*

*Egestula egesta* (Gray)

*Mocella eta*

*Subflectola caputspinulae* (Reeve)

*Climocella akarana*

*Mocella cogitata* Iredale

<sup>10</sup> Only 15 species were listed in original text.

Other species were:-

*Phrixgnathus erigone* (Gray)

*Tornatellinops novoseelandica* (Pfeiffer)

*Delos coresia* (Gray)

*Delos nsp. (green)*

*Delos jeffreysiana* (Pfeiffer)

"The specimens of *Delos coresia* were of particular interest because of their unusual colour - pale translucent green with no sign of colour pattern. *Egestula egesta* is not as a rule very plentiful but, strangely enough it seems to like living under stones and rocks covered with wandering jew, both here and in certain areas similarly weed-covered at the base of Mt. Eden".

#### Land Snails From South Auckland 1990 - Jim Goulstone

Poirieria Vol. 16, No. 2, Page 14.

"I (Goulstone) wonder how much longer this poor neglected Reserve can last. When one reads the description of it in Lucy Cranwell's 'Botany of Auckland', it is apparent how badly this 'jewel without price' has been plundered. It still harbours quite a few native snails which I have placed in this "secure reserve" section more in hope than conviction".

#### A description of Grafton Gully - trees and plants

Botany of Auckland, Lucy Cranwell, 1981

"Earlier versions of this book describe a rich patch of bush that flourished below Grafton Bridge until 1965. Over 60 species<sup>11</sup> could be noted there during a lunchtime ramble. By 1966 only a small area of natives, mixed with introduced trees, remained near the old cemetery on Symonds Street. All the rest had been stripped naked and was soon clothed with concrete to give access to the middle of the City. The area now looks as though some giant had played on it a savage, if sophisticated trick. However, there is nothing gentle about modern traffic, or its insatiable demands; so with the damage done, we can only plan to heal some of the wounds it inflicts on our wild-life. On 13 August 1971, citizens began to help with plantings of native species: even children came with their small shovels. Oldsters in particular worked manfully because they thought something of value could still be done to offset the work of the bulldozers. Public interest in replanting is still high. A hopeful sign is that, by careful searching, John Bartlett and Rhys Gardner were able to list 57 species of native plants (one 9-metre taraire included) in the Gully in 1979.

#### As it was and cannot be again

Nothing brings back the gurgling stream we knew, but the printed word is not as easily muted: the following paragraphs culled from Wall and Cranwell (1943) will give some idea of the beauty and interest this 'glen' once held for townspeople. There appears to be no other record of its vegetation. Formerly, when looking up the gully from the bridge, the eye was soothed by the billowing canopy of big forest trees such as puriri, tikoki, kohekohe, karaka and aspiring rewarewa, each with its own easily recognised shade of green. In this pleasant mosaic the golden-green crowns of many tree ferns stand out clearly<sup>12</sup>. The valley bottom is covered with forest of a very fine type, and comparatively little disturbed. In parts it is surprisingly sylvan; in others it is dense and jungle-like, with great bush lawyers, kaihua or New Zealand jasmine, and pohuehue running into the crown of the trees. The densest of these turns out to be taraire, a handsome tree that is rarely seen near the City. Many trees and shrubs add to the rich growth; for example pigeonwood, mahoe, rangiora, heketara, patete, houpara (usually found near the sea),<sup>13</sup> towai, hangehange or pigwood, kowhai, kawakawa, and ti<sup>13</sup> or cabbage tree, together with surprisingly large specimens of kotukutuku or fuchsia, which is happy when storm-water deposits yellow silt around it, as happens frequently below the bridge.

"Throughout ferns are common, especially the many runnels that drop steeply into the main stream, cradled either in clear yellow clay or the sandstone close under it. Various spleenworts grow here,

<sup>11</sup> Wall and Cranwell 1936 states, "In the ordinary man's lunch-time over 80 species can be noted."

<sup>12</sup> Wall and Cranwell's text included putaputaweta, *Carpodetus serratus*, at this point.

<sup>13</sup> Wall and Cranwell's text specifically states ti kouka (*Cordyline australis*).

or high on the trunks with *Polypodium diversifolium* and *Cyclophorus serpens*; scented fern (*Paesia scaberula*), the pink Doodia and the trembling bracken (a species of *Pteris*) pick out dryer banks and cuttings, while fine trunks of ponga (*Cyathea dealbata*) and mamaku (*C. medullaris*), the latter often 40 to 50 feet high, frame every vista.

Three species of *Gahnia* are abundant, and there are other sedges. Most unexpected of all is the tall goblin or hooded orchid (*Pterostylis banksii*), big clumps of which push up each year even under the Australian gums. Bush rice grass, our biggest species of *Microlaena*, covers a great deal of the ground with its shaggy green leaves, in welcome contrast to the wandering jew (*Tradescantia fluminensis*) on the forest floor. Seedlings are abundant; there are enough young rewarewa and puriri to reclothe the despoiled parts of Newmarket Gully (once forest too) or the Auckland Domain<sup>14</sup>.

"It should be added that early photographs suggest that much of Grafton Gully had been cleared: the lush growth of a century later had thus developed from gully-bottom stands".

#### An Unpublished List of Native Trees and Plants (Held in the Auckland Museum)

#### Some Species Lists on the Native Plants of the Auckland Region

(Section - Grafton Gully) R. O. Gardner 1981

##### FERNS

|   | NEW NAMES                    |
|---|------------------------------|
| <i>Adiantum hispidulum</i>                                |                              |
| <i>Asplenium bulbiferum</i> subsp. <i>bulbiferum</i>      |                              |
| <i>Asplenium lamprophyllum</i>                            |                              |
| <i>Asplenium oblongifolium</i>                            |                              |
| <i>Blechnum chambersii</i>                                |                              |
| <i>Blechnum membranaceum</i>                              |                              |
| <i>Cyathea dealbata</i>                                   |                              |
| <i>Cyathea medullaris</i>                                 |                              |
| <i>Doodia media</i>                                       | <i>Doodia australis</i>      |
| <i>Lastreopsis glabella</i>                               |                              |
| <i>Lastreopsis microspora</i> subsp. <i>pentangularis</i> |                              |
| <i>Paesia scaberula</i>                                   |                              |
| <i>Phymatosorus diversifolius</i>                         | <i>Microsorum pustulatum</i> |
| <i>Phymatosorus scandens</i>                              | <i>Microsorum scandens</i>   |
| <i>Pneumatopteris pennigera</i>                           |                              |
| <i>Pteris tremula</i>                                     |                              |
| <i>Pyrrosia serpens</i>                                   | <i>Pyrrosia eleagnifolia</i> |

##### DICOT TREES & SHRUBS

|  |   |
|--|---|
| <i>Alectryon excelsus</i>  |   |
| <i>Beilschmiedia tarairi</i> (one young adult; no regen.)                                |   |
| <i>Brachyglottis repanda</i>   |   |
| <i>Carmichaelia aligera</i>  | <i>Carmichaelia australis</i>                     |
| <i>Coprosma australis</i>  | <i>Coprosma grandifolia</i>                       |
| <i>Coprosma lucida</i>   |   |
| <i>Coprosma macrocarpa</i> (unnamed variety)   |   |
| <i>Coprosma robusta</i>  |   |
| <i>Corynocarpus laevigatus</i>   |   |
| <i>Cyathodes fasciculata</i>   | <i>Leucopogon fasciculata</i>                     |
| <i>Dysoxylum spectabile</i>  |   |
| <i>Entelea arborescens</i> (one old adult; no regen.)                                    |   |
| <i>Fuchsia excorticata</i>   |   |
| <i>Geniostoma ligustrifolium</i>   | <i>Geniostoma rupestre</i>                        |
| <i>Hedycarya arborea</i>   |   |
| <i>Knightia excelsa</i>  |   |
| <i>Macropiper excelsum</i> f. <i>excelsum</i>  | <i>Macropiper excelsum</i> subsp. <i>excelsum</i> |
| <i>Melicynus ramiflorus</i>  |   |
| <i>Metrosideros excelsa</i> (one young adult)  |   |
| <i>Myrsine australis</i>   |   |
| <i>Pittosporum crassifolium</i>  |   |
| <i>Pomaderris phyllicifolia</i> var. <i>ericifolia</i>                                   |   |
| <i>Pseudopanax lessonii</i> (young plants only? Entering in seed 'rain' <sup>14</sup> .) |   |

<sup>14</sup> Seed 'rain' - Carried by wind or birds.

|   |                               |
|---|-------------------------------|
| <i>Schefflera digitata</i>                                    |                               |
| <i>Vitex lucens</i>   |                               |
| <b>MONOCOTS</b>   |                               |
| <i>Carex flagellifera</i>                                     |                               |
| <i>Carex lambertiana</i>                                      |                               |
| <i>Carex ochrosaccus</i>                                      |                               |
| <i>Carex solandri</i>   |                               |
| <i>Cordyline australis</i>                                    |                               |
| <i>Cordyline pumilio</i>                                      |                               |
| <i>Dianella nigra</i>   |                               |
| <i>Freycinetia baueriana subsp. banksii</i>                   | <i>Freycinetia banksii</i>    |
| <i>Gahnia lacera</i>  |                               |
| <i>Gahnia setifolia</i>                                       |                               |
| <i>Juncus sarophorus</i>                                      |                               |
| <i>Juncus sp. (?J. usitatus; Gardner 2906)</i>                |                               |
| <i>Microlaena avenacea</i>                                    |                               |
| <i>Microlaena stipoides</i>                                   |                               |
| <i>Opismenus imbecillus</i>                                   | <i>Opismenus hirtellus</i>    |
| <i>Poa anceps</i>   |                               |
| <i>Scirpus reticularis</i>                                    | <i>Isolepis reticularia</i>   |
| <i>Uncinia uncinata</i>                                       |                               |
| <b>HERBS</b>  |                               |
| <i>Polygonum decipiens</i>                                    | <i>Polygonum salicifolium</i> |
| <i>Senecio minimus</i>  |                               |
| <b>LIANES</b>   |                               |
| <i>Muehlenbeckia australis</i>                                |                               |
| <i>Rubus cissoides</i>  |                               |
| <b>Early Collections</b>                                      |                               |
| <i>Coprosma repens</i> (Goulding 29.11.71, AK129361)          |                               |
| <i>Pterostylis banksii</i> (Wadham 9.1946, AK140605)          |                               |
| <i>Scirpus inundatus</i> (Hynes & Goulding 21.5.71, AK128517) |                               |
| " "   | <i>Isolepis inundata</i>      |

### Update

This species list was compiled in 1981. Since then the following species of native vegetation, either new or rediscovered in the Grafton Gully - Symonds Street Cemetery have been located:

|             |                              |
|-------------|------------------------------|
| Parataniwha | <i>Elatostema rugosum</i>    |
| Taupata     | <i>Coprosma repens</i>       |
| Rimu        | <i>Dacrydium cupressinum</i> |
|             | <i>Hebe sp.</i>              |

Also an unconfirmed sighting of *Pterostylis banksii* and a species of *Lycopodium*. It would now be timely to update this list!

### Early Landsnail Records

- \*1) One sample labelled Cemetery Gully, Auckland. ( 6 specimens of *Delos* - (faded) Museum of N.Z.
- \*2) Cemetery Gully, Auckland L8201, AK 90982, 14 specimens of *Delos* (faded)
- \*3) Grafton Gully, Norm Gardner, -/10/1966. In leafmould under rocks covered in Wandering Jew, beneath Ponga Ferns and Kawakawa. Private Collection.
- \*4) Grafton Gully, Fred Brook, 1/4/1977. Under dead Ponga Fronds (South side of bridge). 11/677809 Auckland Museum (L22325)
- \*5) Grafton Gully, B. F. Hazelwood, 25/9/1977. Under Wandering Jew/Oak. (North side of bridge). R11/677811 Museum of N.Z.
- \*6) Grafton Gully, J. F. Goulstone, 25/9/1977. Under Wandering Jew/Oak. (North side of bridge) R11/677811 (Trip with B.F.H.) Auckland Museum.
- \*7) Grafton Gully, J. F. Goulstone, -/11/1985. Tree Fern/Cabbage Tree/Mahoe. Auckland Museum
- \*8) Grafton Gully, J. F. Goulstone, -/8/1986. Near bottom of gully. (Puriri on steep bank) Auckland Museum

### Recent Locality Records 1998 - 2001

#### Grafton Gully, (North of Bridge)

- 9) Under Wandering Jew/Kawakawa/Oak. (B.F.H) 26/9/1998, (R11/677811) (M.N.Z.)
- 10) Mahoe/Carex Grass/Pigeonwood/Oak. (B.F.H) 18/10/1998, (R11/677811) (M.N.Z.)
- 11) Under Wandering Jew/Oak (at bottom), good stuff! (B.F.H) 18/10/1998, (R11/677811) (M.N.Z.)
- 12) Under Wandering Jew/Oak, (Near Fig Tree). (B.F.H) 21/11/1998, (R11/677811) (M.N.Z.)
- 13) Wandering Jew/Mistflower/Oak. (B.F.H) 21/11/1998, (R11/677811) (M.N.Z.)
- 14) Under introduced ferns, *Nephrolepis cordifolia*. (B.F.H) 21/11/1998, (R11/677812) (M.N.Z.)
- 15) Base of Morton Bay Fig/Wandering Jew. (B.F.H) 6/2/1999, (R11/677811) (M.N.Z.)
- 16) Under Wandering Jew/Oak, (Same as sample 10). (B.F.H) 23/1/1999, (R11/677811) (A.M.).
- 17) Rock wall, St. Martins Lane, Ivy/Oak/Japanese Honeysuckle *Lonicera japonica* / *Fagus sylvatica*. (B.F.H) 11/7/1999 (R11/677812) (A.M.)

### South of Bridge

- 18) Base of Oak Tree/Ivy, (Near graves), above grave track. (B.F.H.) 18/10/1998, (R11/677808) (M.N.Z.)
- 19) Under Wandering Jew (Wet), bottom track, (B.F.H.) 18/10/1998 (R11667810) (M.N.Z.)
- 20) Base of tree fern/Cabbage tree, bottom track. (B.F.H.) 18/10 1998, (R11/677809) (M.N.Z.)
- 21) Wandering Jew/Oak/Scoria (Just south of Parataniwha), Grave Track. (B.F.H.) 23/1/1999, (R11/677809) (M.N.Z.)
- 22) Mixed litter - Kawakawa/Karaka/Kohekohe/Tree Fern/Cabbage Tree/Oak/ Pine needles/Rewarewa/Patete and a little Wandering Jew, Bottom Track. (B.F.H.) 23/1/1999 (R11/677808 - R11/677810) (M.N.Z.)
- 23) Wandering Jew beside watercourse, below Bottom Track. (B.F.H.) 23/1/1999, (R11/677809) (A.M.)
- 24) Bāsē ū largē Pōl Jackson Fig/Ivy/*Coprosma macrocarpa*, between Top Track and Grave Track. (B.F.H.) 7/8/1999, (R11/677808) (A.M.)
- 25) Regenerating Bush, south end of Grave Track. Tree Fern/Kawakawa/Mahoe/ Hangehange/Patete. (B.F.H.) 7/8/1999, (R11/677809) (M.N.Z.)
- 26) Base of rocks/Ivy/*Hebe sp.*, beside motorway onramp. Below Top Track. (B.F.H.) 23/1/1999, (R11/677808) (M.N.Z.)
- 27) Kawakawa/Oak/Scoria/Carax Grass. Just south of intersection- Grave and Bottom Tracks, beside motorway onramp. (B.F.H.) 22/8/1999, (R11/676808) (M.N.Z.)
- 28) Scoria/Wandering Jew/Manuka/Wattle/Flax, beside motorway onramp (eastern bank). (B.F.H.) 22/8/1999, (R11/676808) (M.N.Z.)
- 29) Scoria/Manuka/Grass etc, beside motorway onramp (eastern bank). (B.F.H.) 28/2/2001, (R11/676808) (M.N.Z.)
- 30) Kawakawa/Mahoe, (Mixed localities - north and south of bridge). (B.F.H.) 18/10/1998, (R11/677808 plus R11/677811) (M.N.Z.)

### Symonds Street Cemetery-(West Side)

- 31) Low rock wall/Wandering Jew (West Side). (B.F.H.) 23/1/1999, (R11/675811) (M.N.Z.)
- 32) Wandering Jew/Flax, (West Side). (B.F.H.) 23/1/1999, (R11/675810) (M.N.Z.)

### Symonds Street Cemetery - Grave Sites (East Side)

#### North of Bridge

33g) Unmarked Grave, near northern boundary, [opposite Major Family Plot, just south of William Walter Plot]

Oak/Kawakawa/Wandering Jew/Tree Fern. (B.F.H.) 6/2/1999, (M.N.Z.), (R11/677812)

34g) Charles Major Died 22nd Sept. 1882  
Hannah Major Died 22nd March 1909

UnderWandering Jew, (B.F.H.) 6/2/1999 (M.N.Z.) (R11/677812)

35g) Mary Lander Died August 1881.

Kawakawa/Oak/Pinoak. (B.F.H.) 11/7/1999 (A.M.) (R11/677811)

36g) John Griffith Rennie Died June 1887  
Alexander Rennie Died July 1884

Oak/Kawakawa + bcside grave, under Kawakawa. (B.F.H.) 11/7/1999 (A.M.) (R11/677811)

37g) Charlotte Heron Died 30th Jan. 1885  
James Heron Died 20th Nov. 1908

Oak/*Fagus silvatica*, beside northern motorway. (B.F.H.) 8/8/1999 (A.M.) (R11/677812)

38g) Jane? Carr Died  
Mary Ann Firth Died 20th Nov. 18??

Oak/Pinoak (B.F.H.) 8/8/1999 (A.M.) (R11/677811)

#### South of Bridge

39g) Joseph Thomas Faulder Died?

Ivy/Oak (B.F.H.) 6/2/1999 (M.N.Z.) (R11/677808)

40g) Rose Ethel Clarke Died 14th Oct. 1884  
David Clarke Died 6th Feb. 1884  
Joseph Clarke Died 11th Sept. 1889  
Mary Clarke?

Oak/Ivy/Karaka. (B.F.H.) 6/2/1999 (M.N.Z.) (R11/677810)

41g) John Thomas Canham Died 5th Dec. 1893  
Joanna Canham Died 11th Dec. 1908  
Harry Canham Died 11th Oct. 1910  
Elizabeth Gentry Canham Died 11th Oct. 1936

Oak/Ivy/Mistflower. (B.F.H.) 26/6/1999 (A.M.) (R11/677810)

42g) Elizabeth Sexton Died 20th April 1905  
William Thomas Sexton Died 10th Sept. 1908  
Robert Axford Sexton Died 16th Dec. 1875  
Louisa Elizabeth Sexton Died 20th March 1876

*Coprosma macrocarpa*/Oak/Kawakawa. (B.F.H.) 26/6/1999 (A.M.) (R11/677810)

43g) Maria Martha Nash Died 20th Jan. 1899  
S.T.B.R. Nash Died 14th Aug. 1885

Oak/Wandering Jew/bulbs/Ivy. (B.F.H.) 26/6/1999 (A.M.) (R11/677810)

44g) Thomas Samuel Kemp Died March 18??

Oak/Privet/Kawakawa/Ivy/bulbs/pine needles. (B.F.H.) 26/6/1999 (A.M.) (R11/677808)

45g) (1) Gerald Flower Died May 1895

Lancelot William Flower Died 11th Nov. 1902

(2) Lucy Flower Died 22nd Sept. 1901?  
 Beatrice May Flower Died 13th June 1873  
*Coprosma macrocarpa*/Oak/Ivy/Privet. (B.F.H.) 26/6/1999 (A.M.) (R11/677808)  
 46g) John Smith Died 15th Aug. 1882 (Vault collapsed)  
 Oak/Ivy. (B.F.H.) 26/6/1999 (A.M.) (R11/677809)  
 47g) Elizabeth Coulson Died ?  
 Martin Coulson Died ?  
 Oak/Wandering Jew/Ivy/Fern (B.F.H.) 26/6/1999 (A.M.) (R11/677809)  
 48g) ? Dillon Died 16th Aug. 1883  
 P. E. Dillon Died 28th Oct. 1894  
 Oak/Mistflower/Parataniwha. (B.F.H.) 26/6/1999 (A.M.) (R11/677809)  
 49g) Herbert H. Harris Died Aug. 1883  
 Oak/Ivy. (B.F.H.) 11/7/1999 (A.M.) (R11/677810)  
 50g) (1) Kate Gertrude James Died Sept. 1890  
 (2) Margaret Daisley Died 24th July 1884  
 John Daisley Died 17th June 1903  
 Oak [Just below Canham Family Plot]. (B.F.H.) 11/7/1999 (A.M.) (R11/677810)  
 51g) Mary Jane Herd Died May 1887  
 [Just below Thomas Kemp Plot - above track from Joseph Thomas Faulder Plot]  
 Oak/Ivy. (B.F.H.) 11/7/1999 (A.M.) (R11/677808)  
 52g) (1) Jane Power Died Nov. 1915?  
 (2) Susan Power Died 7th Oct. 1875  
 Robert Power Died 15th Dec. 1888  
 Oak/Ivy/Privet/Port Jackson Fig. (B.F.H.) 11/7/1999 (A.M.) (R11/677808)  
 53g) (1) Kitty White Davey Died 30th Sept. 1854  
 (2) Robert Gillingham Died Nov. 1856  
 Oak/Ivy/grass, [Above Top Track - Up from John Smith Vault]. (B.F.H.) 11/7/1999 (A.M.) (R11/677809)  
 54g) William Gamble Died Dec. 1861  
 Catherine Gamble Died 1st March 1861  
 William Gamble (Son) Died 3rd July 1916  
 John Gamble Died 11th July 1886  
 Ann Gamble Died 7th May 1899  
 Oak Litter - Wet! (Above Top Track). (B.F.H.) 11/7/1999 (A.M.) (R11/677809)  
 55g) James Ridler Died 13th Nov. 1878  
 Base of large Pine Tree/Ivy/Oak, (Grave Track). (B.F.H.) 22/8/1999 (A.M.) (R11/677809)  
**Freshwater**  
 56f) Small creek at bottom of gully, (under bridge). (B.F.H.) 13/9/2001 (R11/677810) (M.N.Z.)  
*Physastra variabilis* (under leaves)  
*Potamopyrgus antipodarum* (under rocks)

### Landsnails and Slugs - Species List

#### Native Species

Class **GASTROPODA**  
 Subclass **PROSOBRANCHIA**  
 Order **MESOGASTROPODA**

#### *Hydrocenidae*

1) *Georissa purchasi* (Pfeiffer, 1862)

*Pupinidae: Liareinae*<sup>15</sup>

2) *Cyrtora hedleyi* (Suter, 1894)

3) *Cyrtora torquilla* (Suter, 1894)

4) *Liarea egea egea* (Gray, 1850)

#### *Hydrobiidae* (Freshwater)

5) *Potamopyrgus antipodarum* (Gray, 1843)

6) *Potamopyrgus* sp.

Class **GASTROPODA**  
 Subclass **PULMONATA**  
 Order **STYLOMMAТОPHORA**

#### *Planorbidae* (Freshwater)

7) *Physastra variabilis* (Gray, 1843)

#### *Achatinellidae : Lamellideinae*

8) *Tornatellinops novoseelandica* (Pfeiffer, 1853)

9) *Tornatellides subperforata* (Suter, 1909)

<sup>15</sup> The validity of this family is in doubt?

*Charopidae : Rotodiscinae*

10) *Huonodon hectori* (Suter, 1890)  
11) *Huonodon pseudoleioda* (Suter, 1890)

*Charopidae : Charopinae*

12) *Cavellia buccinella* (Reeve, 1852)  
13) *Feciola infecta* (Reeve, 1852) = *Ptychodon tam*  
14) *Fectola mira* (Webster, 1908)  
15) *Phenacharopa pseudanguicula* (Iredale, 1913)  
16) *Mocella eta* (Pfeiffer, 1853) = *Subfectola caputspinulae* (of N.Z. Workers)  
17) *Paracharopa chrysaugeia* (Webster, 1904)  
18) *Paracharopa fuscosa* (Suter, 1894)  
19) *Climocella akarana* Goulstone, 1996 = *Mocella eta* (of N.Z. Workers) =  
'Mocella' nsp 3 Goulstone = *Mocella cogitata* (of N.Z. Workers)  
20) 'Charopa' n sp. (cf 'Charopa' pilsbryi)  
21) *Flammocharopa costulata* (Hutton, 1883) (not seen this survey - maybe 'Charopa'<sup>16</sup> *parva*)  
22) *Flammulina costulata* subsp. *parva* Suter, 1909 = 'Charopa' pilsbryi (in part)

*Charopidae : Flammulininae*

23) *Flammulina chiron* (Gray, 1850)  
24) *Flammulina perdita* (Hutton, 1883)

*Charopidae : Phenacohelcinae*

25) *Phenacohelix giveni* Cumber, 1961  
26) *Phenacohelix pilula* (Reeve, 1852)  
27) *Phenacohelix ponsonbi* (Suter, 1897)  
28) *Phenacohelix zigzag* (Gould, 1848)  
29) *Therasia decidua* (Pfeiffer, 1857)<sup>17</sup>  
30) *Suteria ide* (Gray, 1850)

*Charopidae ?*

31) *Therasiella neozelanica* Cumber, 1967  
32) *Therasiella tamora* (Hutton, 1883)  
33) *Therasiella* nsp. (cf *neozelanica*) (Sp 2000 : )

*Helicodiscidae ?*

34) *Egestula egesta* (Gray, 1850)<sup>18</sup>

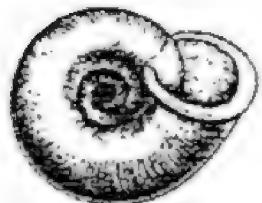
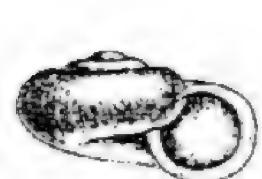
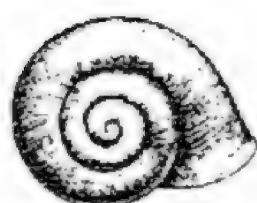
*Punctidae*

35) *Laoma leimonias* (Gray, 1850)  
36) *Laoma marina* (Hutton, 1883)  
37) *Paralaoma caputspinulae* (Reeve, 1852) = *Paralaoma pumila* = *Paralaoma raoulensis*  
38) *Paralaoma lateumbilicata* (Suter, 1890)  
39) *Phrixgnathus ariel* Hutton, 1883  
40) *Phrixgnathus conella* (Pfeiffer, 1862)  
41) *Phrixgnathus erigone* (Gray, 1850)  
42) *Phrixgnathus fulguratus* (Suter, 1909)  
43) *Phrixgnathus poecilosticta* (Pfeiffer, 1853)  
44) *Punctid* nsp. 1 = *Punctid* nsp. 3 Goulstone (Sp 2000 : *Punctid* nsp 203 )  
45) *Punctid* nsp. 5 (Sp 2000 : *Punctid* nsp 71 )  
46) *Punctid* nsp. 6 (Sp 2000 : *Punctid* nsp 186 )  
47) *Punctid* nsp. 8 (Sp 2000 : *Punctid* nsp 72 )  
48) *Punctid* nsp. 23 = *Pasmaditta jungermanniae* (of N.Z. Workers) (SP 2000 : *Punctid* nsp 67 )  
49) *Punctid* nsp. 29 (Sp 2000 : *Punctid* nsp 100 )  
50) *Punctid* nsp. 32 (Sp 2000 : *Punctid* nsp 81 )  
51) *Punctid* nsp. (aff *ariel*) Goulstone (Sp 2000 : *Punctid* nsp 140 )

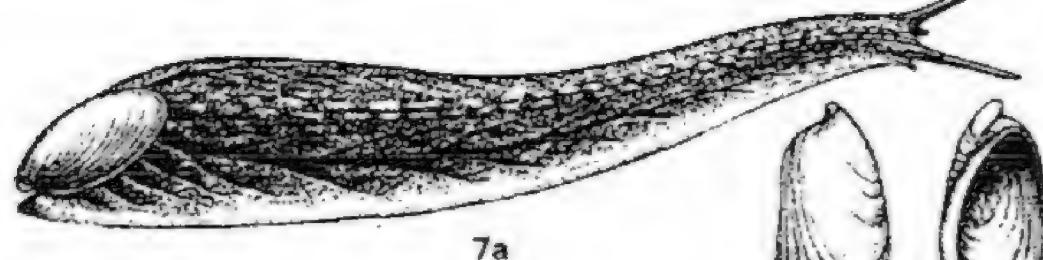
<sup>16</sup> Single quotation marks denote a new species that differs from that quoted.

<sup>17</sup> Dr Frank Climo considered that *Therasia decidua* (Pfeiffer, 1857) was synonymous with *Thalassohelix zelandiae* (Gray, 1843). This has not been proven! Therefore, we are following Jim Goulstone in using *T. decidua* for this form. Where do the type specimens of *T. zelandiae* and *T. decidua* come from?

<sup>18</sup> We follow Spencer and Willan 1995 in using the Helicodiscidae for *Egestula* Iredale, 1915: type species, *Helix egesta* Gray, 1850. We seriously doubt whether it belongs here! Helicodiscidae Morse 1864: 25, type species *Helix lineata* Say, 1817 (not of Olivi, 1792) = *Helicodiscus parallelus* (Say, 1821), by monotypy.



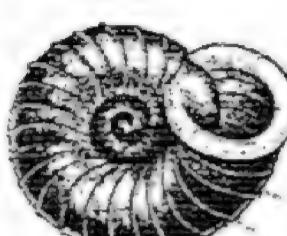
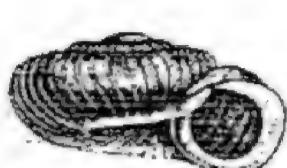
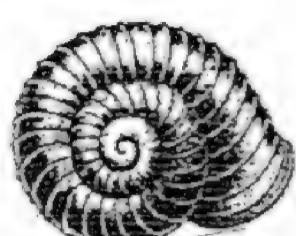
*Vallonia excentrica*  $\times 9$



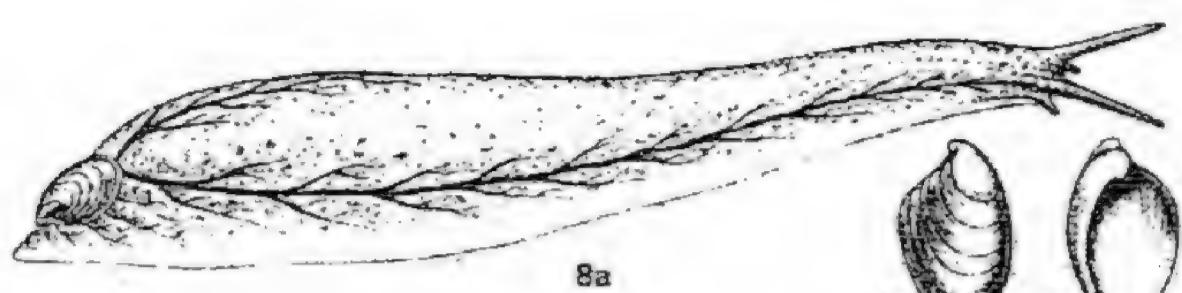
7a

7b

7c



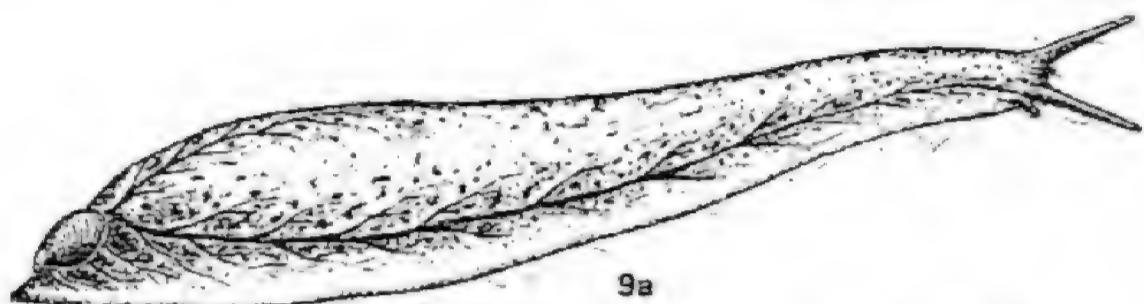
*Vallonia costata*  $\times 9$



8a

8b

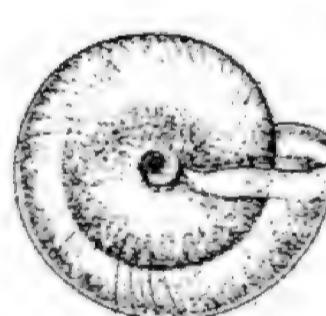
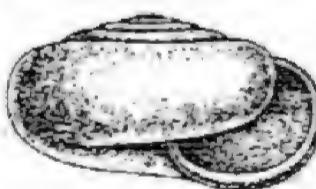
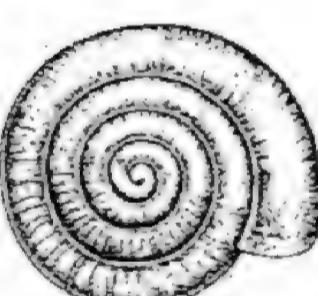
8c



9a



*Helicodiscus singleyanus*  $\times 9$



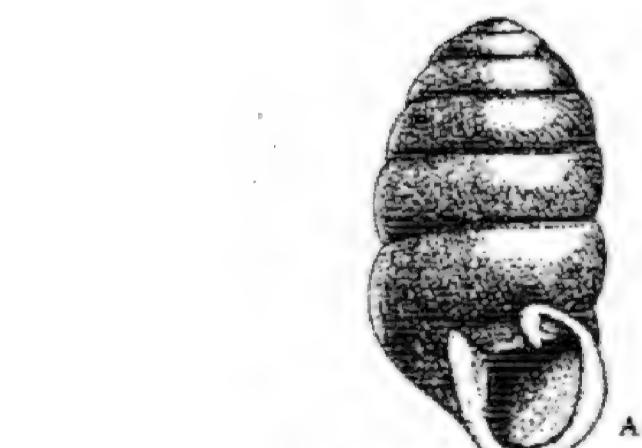
*Vitrea crystallina*  $\times 7$



*Cecilioides acicula*  $\times 7$



*Lauria sempronii*  $\times 11$

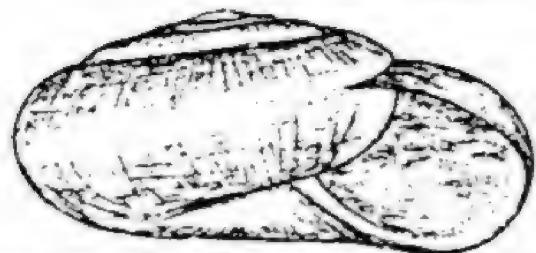


A



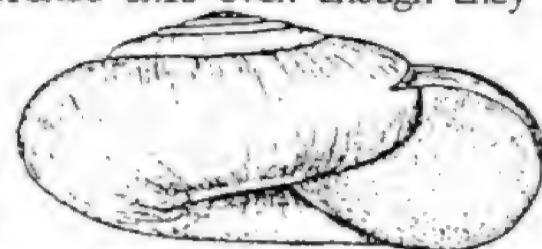
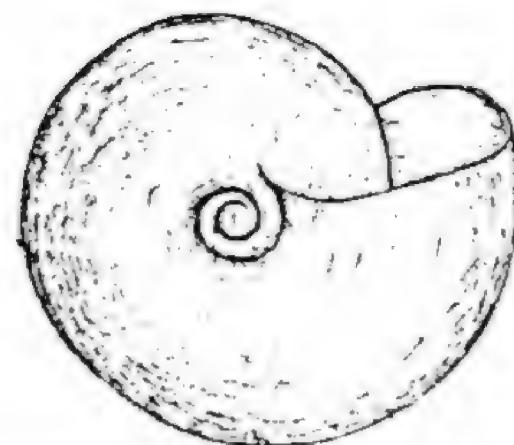
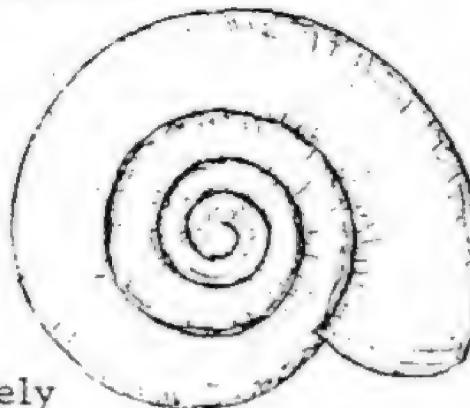
*L. cylindracea*  $\times 11$  A, adult B, juvenile, frontal and basal views

Introduced Species.

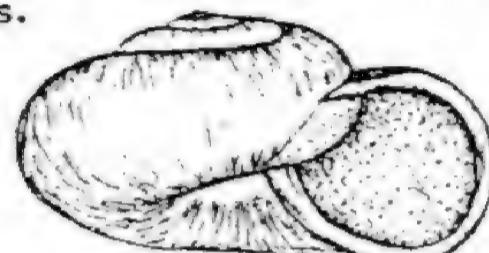


*Oxychilus* sp. 7 x 3.5 mm. Wiri Swamp.

There is a general belief that we have 3 species of *Oxychilus* in Auckland, namely *Oxychilus allarius* (Miller), *Oxychilus cellarius* (Miller), *Oxychilus draparnaldi* (Beck), but no-one seems to have seriously researched this even though they are our commonest species. G.M. Barker has sent me a paper by D.C.Lloyd 'The use of skin characters as an aid to the identification of the British species of *Oxychilus* (Fitzinger).' (J.nat.Hist., 1970, 4: 531-534)., but I haven't tried it out yet. These are the snails most likely to invade the native bush though strangely there seems to be a deterrent in the native litter which resists them for in most un-modified Reserves they have penetrated little if at all. Even some of the Manurewa reserves, greatly modified and with few native snails, but with all native trees, still have no *Oxychilus*.

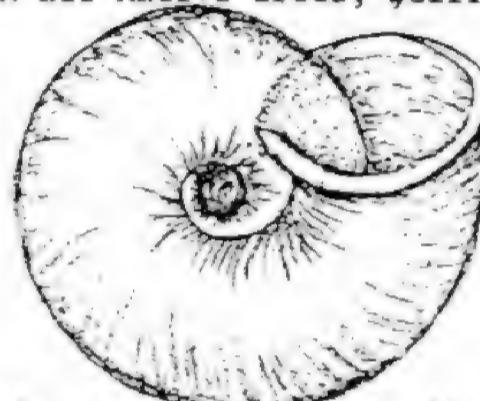
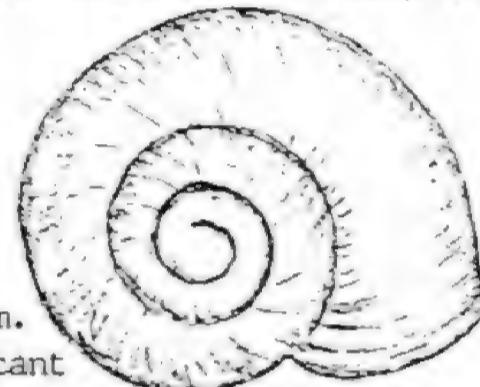


*Oxychilus* sp. 10.5 x 5 mm. Mangere.



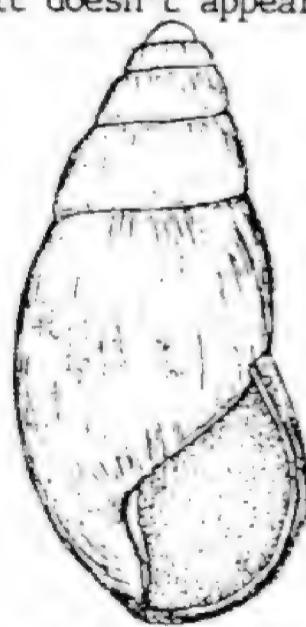
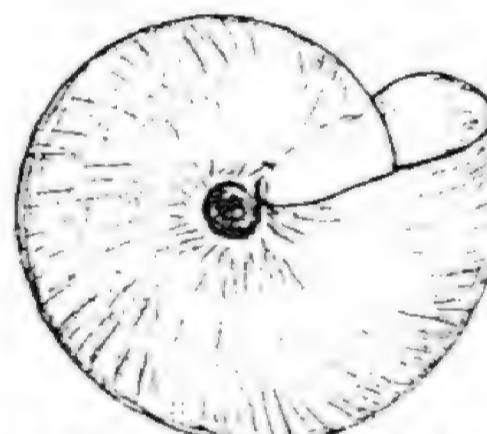
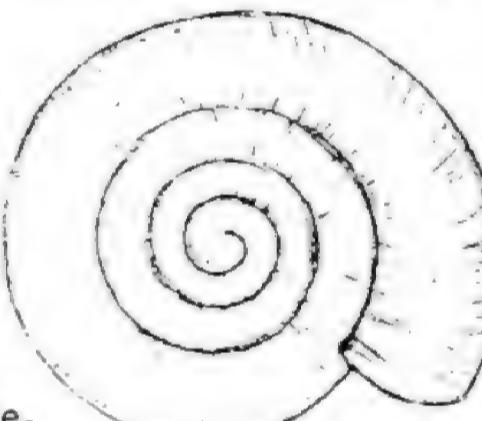
*Vallonia excentrica* (Sterki). 2.4 x 1.2 mm.

Mangere. An insignificant white shell with a thickened expanded lip. I think it is more numerous than we realise. For example on my own section here at Mangere there are literally hundreds in the grass whenever I care to look for them and they seem particularly attracted to a clump of bamboo. They are just too small to notice without an effort.



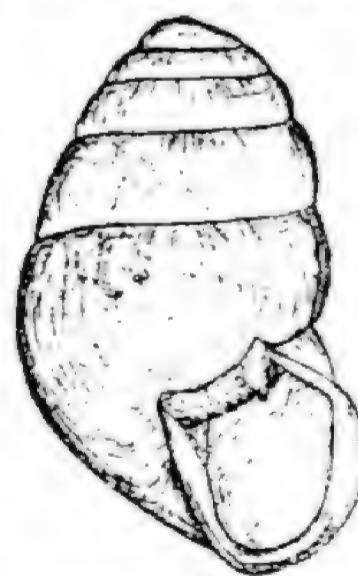
*Vitrea crystallina* (Miller).

2.5 x 1.3 mm. Auckland Domain. The name aptly describes this shell which I only found at the one place. This was a bushy site, mostly introduced trees with a lot of Privet but I believe it prefers a wet site. It doesn't appear to be all that common around Auckland.



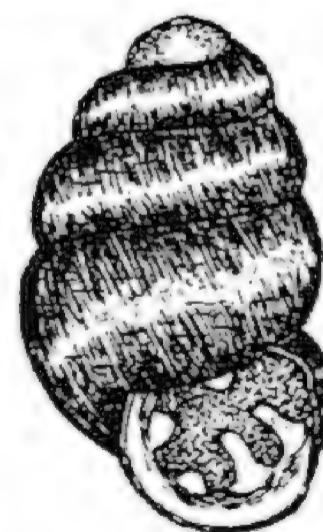
*Cochlicopa lubrica* (Miller) 2.4 x 5.5 mm

Mt. Wellington. A prolific snail around Auckland in rocks, under hedges or in practically any cover.

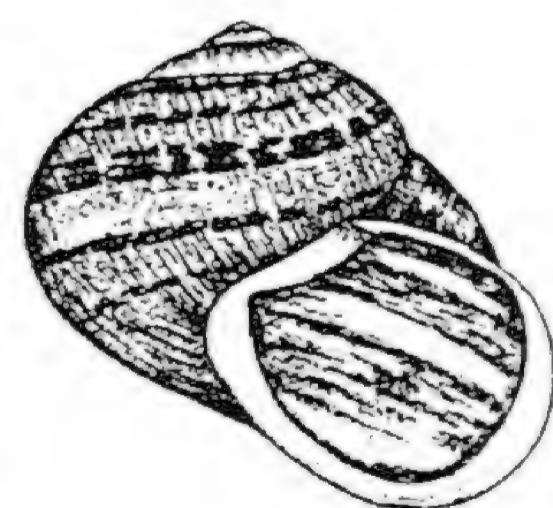


*Lauria cylindracea* (da Costa). 2 x 3.4 mm

Papatoetoe. This species has taken over the rock walls in much of Auckland and can be present in large numbers.

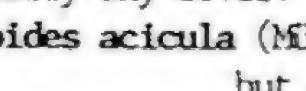


1.2 x 1.9 mm.



3.2 x 3 mm

Auckland Domain. A shell with a patchy distribution.



*Cecilioides acicula* (Miller) but which I have never seen. It is transparent when fresh.

**Rhytididae : Rhytidinae**

- 52) *Delos jeffreysiana* (Pfeiffer, 1853)
- 53) *Delos* nsp (green) (aff *coresia*) (Sp. 2000 : *Delos* nsp 7)
- 54) *Delos* nsp (multistriped) (aff *coresia*) Waitakeres (Sp 2000 : *Delos* nsp 6)
- 55) *Delos* nsp (multistriped) (aff *coresia*) North Shore - Piha (Sp. 2000 : *Delos* aff *coresia*)
- 56) *Rhytida greenwoodi greenwoodi* (Gray, 1850)

**Introduced Species**

*Cochlicopidae*

- 57) *Cochlicopa lubrica* Müller, 1774

*Helicodiscidae*

- 58) *Helicodiscus (Hebetodiscus) singleyanus*<sup>19</sup> (Pilsbry, 1889) = *Hydophrea academia* (Climo, 1970)

*Helicidae: Helicinae*

- 59) *Cantareus aspersus* (Müller, 1774)

*Pupillidae: Laurinae*

- 60) *Lauria cylindracea* (da Costa, 1778)

*Valloniidae*

- 61) *Vallonia costata* (Müller, 1774)

- 62) *Vallonia excentrica* Sterki, 1893

*Vertiginidae: Vertigininae*

- 63) *Vertigo ovata* (Say, 1822)

*Zonitidae: Zonitinae*

- 64) *Oxychilus alliarius* (Miller, 1822)

- 65) *Oxychilus cellarius* (Müller, 1774)

- 66) *Oxychilus draparnaudi* (Beck, 1837)

- 67) *Vitrella (Vitreu) crystallina* (Müller, 1774)

*Arionidae: Arioninae*

- 68) *Arion intermedius* Normand, 1852

*Testacellidae*

- 69) *Testacella haliotidea* Draparnaud, 1801

**Slug Shell**

- 70) *Dead shell* (Indet.)

**Discussion Notes**

Native snails are still present in the graveyard. Those collected were generally very old and very dead. Quantities of shells collected, indicate high mortality rates. However fresh specimens are still present in the upper levels. The Grave Track Zone, provides the most species within the cemetery, especially under fallen headstones. Few live specimens were collected! Introduced snails and slugs prefer the modified, cemetery environment, but will encroach into the bush. Introductions were present in most situations. Recent defoliation and restoration of the graveyard has all but destroyed these refugia! Most localities in the Gully were associated with Wandering Jew.

*Helicodiscus (Hebetodiscus)<sup>20</sup> singleyanus* (Pilsbry, 1889) = *Hydophrea academia* (Climo, 1970), is recorded from Grafton Gully, the first record from Auckland. This is a subterranean<sup>21</sup> species! Subsequently, Jim Goulstone located a specimen at the Waikumete Cemetery, Henderson. A third record, by B.F.H. and Hellene (Rose) Taylor, came from Lake Road., just south of Hanlon Crescent, Devonport. Recently a fourth occurrence was recorded from the Auckland Domain, (B.F.H.) then a fifth, from the end of South Titirangi Road, Titirangi. (B.F.H.)

*Vallonia costata* (Müller, 1774) is confirmed as a naturalised species in NZ Authority - Gary Barker, locality Grafton Gully (B.F.H.), amongst scoria/Wandering Jew.

Two other specimens of *V. costata* were found in bush at the Auckland Domain (B.F.H.).

*Vallonia costata* (Müller, 1774) was first recorded from NZ by the Rev. H Whitton. These specimens were collected by Norm Gardner (approx. 1954).

Bulletin No 11, Con. Sect. Auck. Mus., Pages 2-3, 1955.

Bulletin No 13, Con. Sect. Auck. Mus., Page 14, 1957.

<sup>19</sup> *Helix scintilla* Lowe, 1852 has priority over *Zonites singleyanus* Pilsbry, 1890. It is in accordance with ICZN Article 23b to render *scintilla* obsolete in favour of the well established name *singleyanus* (Pilsbry), but a case to ICZN for this action has not been made.

<sup>20</sup> *Hebetodiscus singleyanus* has a tricuspid radula. Is this a punctid? (Climo 1974) Living New Zealand specimens display a long bursa copulatrix duct, as does the type of *Helicodiscus*. This is a typical feature of *Helicodiscus*.

<sup>21</sup> Subterranean - living underground.

The specimens were numerous, collected on a shed roof, beneath a *Bignonia tweediana* plant at 7 Jubilee Avenue, North Head, Devonport, Auckland. This residence belonged to Noel Gardner's grandmother. All specimens were deposited in Harry Whitton's collection, subsequently destroyed by fungus, the result of a flood. Pers. Comm. Ron Whitton - Phone 638-9460 Auckland.

The carnivorous, introduced slug, *Testacella haliotidea* Draparnaud, 1801, which carries a small external shell on its tail, was also found at Grafton Gully - (B.F.H.), (shells only). This is also a subterranean species!

Three new occurrences of *T. haliotidea* from Auckland are listed.

Epsom; Mt. Hobson, Remuera, and beside Middlemore Hospital (shells only) (B.F.H.)

*Testacella maugei* d'Audebard de Féruccac, 1819 is tentatively confirmed as a N.Z. record. A specimen collected (B.F.H.) - Cathedral Flats, 439-461 Parnell Road., Parnell was collected alive while aestivating<sup>22</sup> in consolidated soil, under a piece of timber. This specimen is referable to *T. maugei*. Anatomical examination complete (G. Barker and B. F. Hazelwood in prep.)

Hutton described *Testacella vagans* Hutton, 1882a - Type Locality - Auckland. This is regarded as a synonym of *T. maugei* (Barker 1999).

A specimen of *Testacella*, (shell only), from Mathesons Bay, Leigh, (B.F.H.) differs in having a larger shell than *T. haliotidea*.

A further record of *T. maugei* is from Schooner Bay, Great Barrier Island (under flax)

B.F.H. 28/11/2001

Two species of *Oxychilus*, *O. alliarius* (Miller, 1822) and *O. cellarius* (Müller, 1774) are present. However, some large specimens are proving difficult! It is not confirmed whether some of these are *O. draparnaudi* (Beck, 1837) or all, just gerontic<sup>23</sup> specimens of *O. cellarius*. Specimens of *Oxychilus* were not counted, as these are difficult to separate. Dave Roscoe records *O. draparnaudi* from Grafton Gully, however Jim Goulstone could not distinguish the difference. On examination of material in the Auckland Museum, I, (B.F.H.) noted that some juvenile specimens displayed a pronounced acceleration of the body whorl. Records from The National Museum include *O. draparnaudi*. Those from The Auckland Museum, do not!

Examination of all *Oxychilus* from Symonds Street Cemetery - Grafton Gully require future attention. Is there a fourth species present in New Zealand?

The evidence points to another species related to *O. draparnaudi*, however this may be only a variant of this species which displays a downturn and compression of the last whorl. This form occurs in Europe. Odd looking populations occur in other parts of New Zealand.

*Cochlicopa lubrica* (Müller, 1774), and *Vitrea crystallina* (Müller, 1774) were present. *Vertigo ovata* (Say, 1822) was recorded, but rare. *Lauria cylindracea* (da Costa, 1778) is just establishing itself, this is a prolific species within Auckland - especially in rock walls. *Vallonia excentrica* Sterki, 1893 was inexplicably rare and *Cantareus aspersus* (Müller, 1774) was not common.

The species most notably absent from this survey was *Cecilioides* (*Cecilioides*) *acicula* (Müller, 1774), The Graveyard Snail, but it must be here somewhere! This is a subterranean species. These shells may have been overlooked due to their acutely<sup>24</sup> slender shape. They are extremely difficult to see and may have passed through the one millimetre sieve I use. This species is resident within the Auckland area, new records of *C. acicula* have been recorded from the Almorah Road Bush (Private Property), just below Mercy Hospital - Epsom, (B.F.H.); Jackie Hill, Little Huia, Manukau Harbour (B.F.H.). Also from Opononi - Northland (B.F.H.) and from the type locality of *Potamopyrgus manneringi* Climo, 1974, Waikaretu, Port Waikato. (B.F.H.)

<sup>22</sup> During dry or particularly cold weather *Testacella* species retreat into the soil to depths often greater than 1 meter. Under these conditions the slugs may go into a form of aestivation in earthen cells lined with viscous mucus. Aestivation is a state of sleep, like hibernation, except that this occurs usually during the summer months.

<sup>23</sup> Gerontic - Here refers to shell shape and size being exaggerated by old age.

<sup>24</sup> Acutely - extremely slender or sharp angled.

70 species of snails and slugs have been detected. It is of interest that many of the introduced slugs have not been found. Some of these must be present. Also some common native snails have not been located, especially *Serpho kivi*. They are very conspicuous by their absence.

**There is serious concern as to the future of Grafton Gully due to the Motorway plans of the new Mayor, John Banks.**

**For illustrations of N.Z. Snails - Consult Land Snails From South Auckland 1990 J Goulstone Poirieria Vol 16, No 2, December 1990**

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#### **A Field Guide to the Landsnails of Britain and North-west Europe** **M. P. Kerney and R. A. D. Cameron illustrated by Gordon Riley**

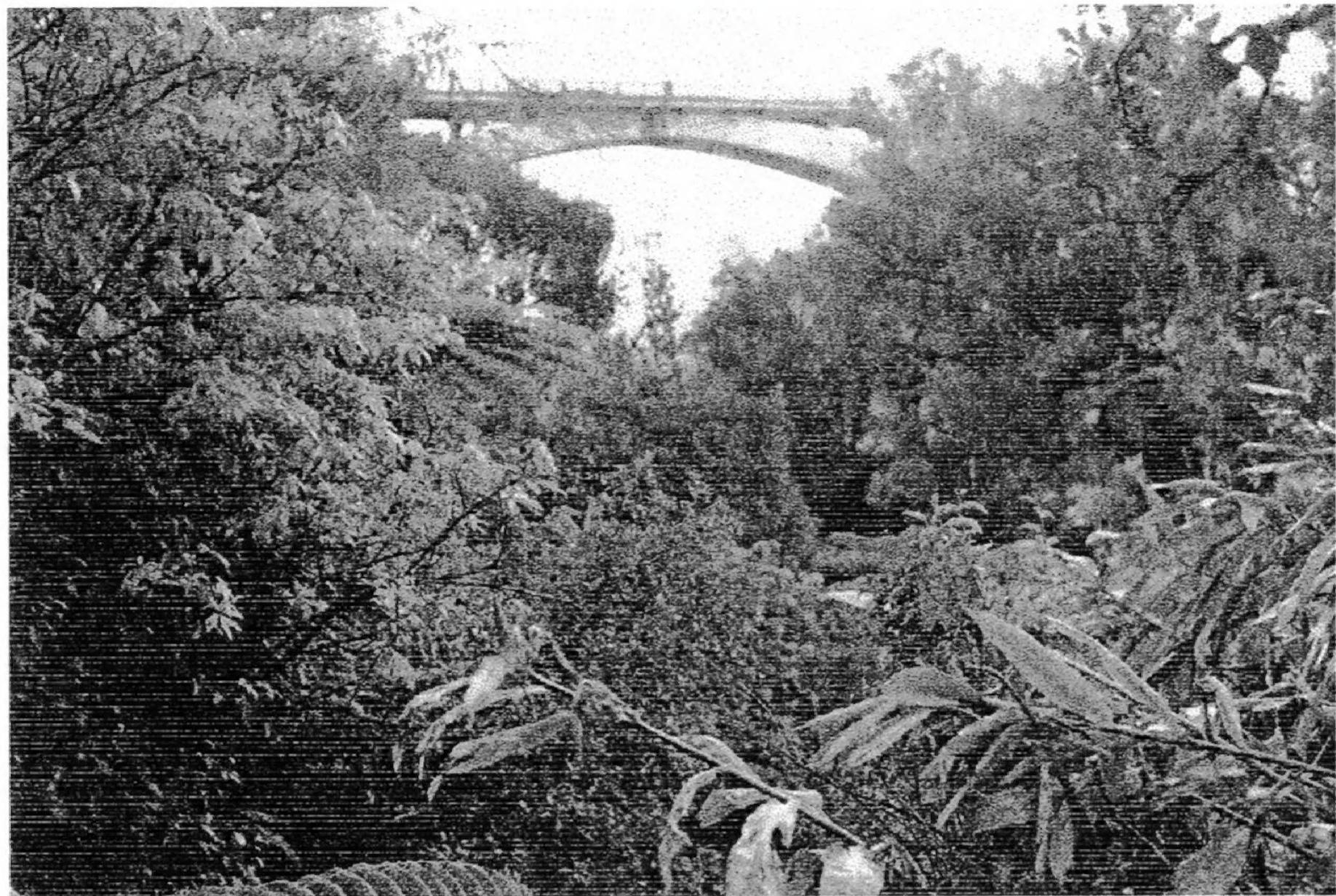
Gordon Riley - 97 Forresters Road, Burbage, Hinckley, Leicestershire, LE 102RU, England

For permission to photocopy illustrations.

Dr. Jane Fröhlich - Landcare Research, Mt Albert -For information regarding - Biocontrol of Mistflower Wises Map, 2 Robert Road, Ellerslie -Permission to photocopy map.

#### **Interested parties for the replanting of Grafton Gully**

|                   |                   |   |
|-------------------|-------------------|---|
| Harold Coop       | Auck. 524-6481    |   |
| Dr. Rod Bielecki  | Auck. 263-8635    |   |
| Bruce Hazelwood   | Auck. 525-0065    |   |
| Frank Boulton     | Auck. 524-0864    |   |
| Dawn Bardsley     | Auck. 379-2020    | Auckland City Council                           |
| John Hogan        | Auck. 415-9336    | N.Z. Trust for Conservation and Volunteers Inc. |
| Susan Sayers      | Auck. 3787527     | Gardener  |
| Ben Allen         | Auck. 8157485     | Te Ngahere Ltd.                                 |
| Alastair Jamieson | Auck. 3794420     | Heritage Dept., A.R.C.                          |
| Michael Pingram   | Auck. 021/2983868 | Student - assisting Te Ngahere Ltd.             |



Grafton Gulley photo by Jim Goulstone

CHARACTER AREAS

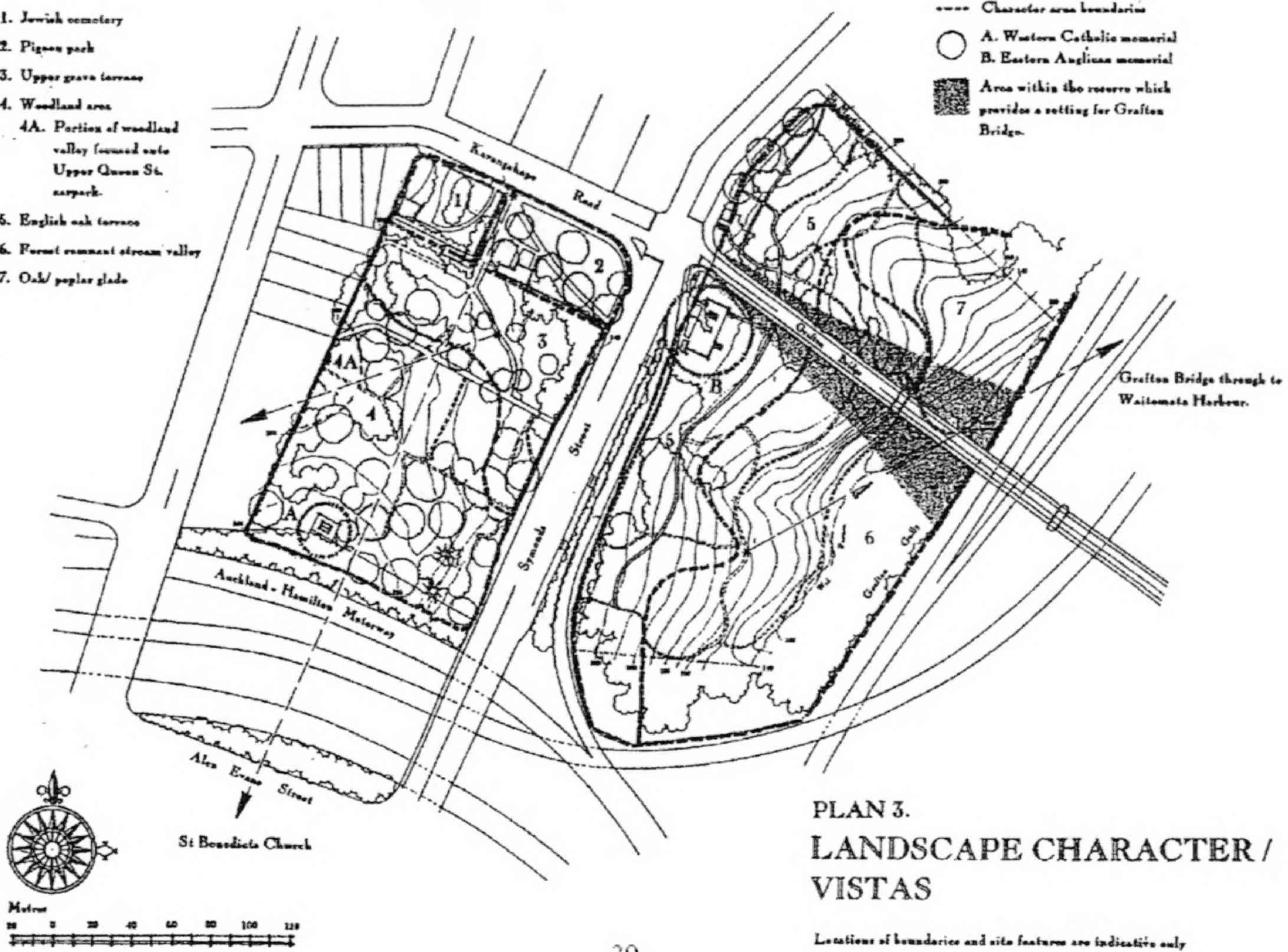
1. Jewish cemetery
2. Pigeon park
3. Upper grave terrace
4. Woodland area
  - 4A. Portion of woodland valley focused onto Upper Queen St. carpark.
5. English oak terrace
6. Forest remnant stream valley
7. Oak/pepper glade

SYMONDS STREET CEMETERY

KEY

- Vista
- Character area boundary
- A. Western Catholic memorial
- B. Eastern Anglican memorial
- Area within the reserve which provides a setting for Grafton Bridge.

Grafton Bridge through to Waitemata Harbour.



PLAN 3.  
LANDSCAPE CHARACTER /  
VISTAS

Locations of boundaries and site features are indicative only

